AD-5200 & AD-5300

Weight Indicator

Installation/Calibration/Operation

Version 1.a
02/7/2005

A&D Weighing
1555 Mc Candless Dr.
Milpitas, CA. 95053
408-263-5333
Fax: 408-263-0119

TABLE OF CONTENTS

INTRODUCTION	**5**
What's in each section	6
GENERAL DESCRIPTION	**8**
The AD-5200 & AD-5300 Display and Keyboard Diagram	8
The AD-5200 & AD-5300 Display	9
The AD-5200 & AD-5300 Keyboard	9
INSTALLATION AND SETUP	**10**
Unpacking the AD-5200 & AD-5300	10
Installation Guide /Safety Instructions	10
Setup Guide	12
NTEP Labeling Instructions	13
USING THE AD-5200 & AD-5300	**14**
Keyboard Layout	14
Operation of Function Keys	15
Memory Registers Entry	15
Execute a scale Basic Function	15
Display time and Date	15
BUILT IN APPLICATION PROGRAMS	**16**
Select Mode of Operation (Parameter73)	16
Mode (1) Fill to Setpoint	17
Mode (2) Check-Weigh, Over, Under or Between	18
Mode (3) Weigh-In Weigh-Out	19
Mode (4) Axle weigh, Short Scale	21
Mode (5) Axle Weigh, Long Scale Unattended	22
Mode (6) ID, Tare and Total	23
Mode (7) Peak Hold	25
SET OPERATION PARAMETERS	**26**
Access Operation Parameters and Parameter Functions	26
Operation Parameter Reference Tables	27
Scale Parameters	30
Parameter 1. Load Cell m/V (3 m/V)	30
Parameter 2. Digital Filter (9)	30
Parameter 3. Display Update Rate (0)	30
Parameter 4. Motion Detection Delay (15)	31
Parameter 5. Motion Detection Band (6)	31
Parameter 6. Enable Display Blanking During Motion (no blanking)	31
Parameter 7. Zero tracking Delay (1)	31
Parameter 8. Zero Tracking Band (12)	31
Parameter 9. Push Button Zero Percent (100)	32
Parameter 10. Primary Units Type (1[lb])	32
Parameter 11. Decimal Point Position (0[no decimal point])	32
Parameter 12. Count–By (1)	32
Parameter 13. Alternate Units Type (2[kg])	32
Parameter 14. Alternate Decimal Point (1)	33

Parameter 15. Alternate Count-By (5)	33
Parameter 16. Alternate Units Conversion Factor (45,360)	33
Parameter 17. Full Scale Graduations (10,000)	33
Parameter 18. Overload Graduations (10,200)	33
Parameter 19. Deadload Offset (automatically set)	33
Parameter 20. Disable Power-on Zero (1[power-on zero disabled])	34
Parameter 21. Deadload Factor (automatically set)	34
Parameter 22. Weight Conversion Factor (automatically set)	34
I/O Port Parameters	34
Parameter 23. Serial Port 1 Mode (4[8 data bits, no parity])	34
Parameter 24. Serial Port 1 Baud Rate (1[9600 baud])	35
Parameter 25. Serial Port 2 Mode (4[8 data bits, no parity])	35
Parameter 26. Serial Port 2 Baud Rate (1[9600 baud])	35
Parameter 27. TX2 Control / Station ID (255[single station])	36
Parameter 28. TX2 Format (2[Condec data format])	36
Printer Parameters	37
Parameter 30. Auto Line Feed after Carriage return (1[yes])	37
Parameter 31. End of Print Character (12[form feed])	37
Parameters 32, 33, 34, 84, 85, 86, 87, 88 and 90 Print Labels	37
Parameters 35, 36, 37 and 38. Print Codes	38
Parameter 39. TTL Remote Control (1[ttl in = scale basic function])	38
Display Intensity, Watch Dog Timer	39
Parameter 40. Display intensity (10)	39
Parameter 41. Battery Enable (0)	39
Parameter 42. Enable Watch Dog Timer (0)	39
Fixed Registers	39
Parameter 43-50. Fixed Registers	39
Keyboard Events	39
Parameters 51-58. Keyboard Event Functions	39
PARAMETER FUNCTIONS	**40**
Function 59. Display Calibration Audit Number	42
Function 60. Calibrate Scale (deadload first)	42
Function 61. Calibrate Scale (span first)	42
Function 62. Calibrate (deadload only)	43
Function 63. Adjust Gain Calibration	43
Function 64. Configure Passwords	44
Function 65. Configure Print Formats	45
Function 66. Configure Time and Date	50
Function 67. Display Operation Parameters	50
Function 68. Print Operation Parameters	50
Function 69. Diagnostic Tests	51
Function 70. Initialize Operation Parameters to Factory Default	51
Function 71. Configure Event monitor	52
Function 72. Scale Basic Function Editor	52
Function 73. Select Mode of Operations	53
Function 74. Configure Timers	54
Function 75. Enable Peak Detect	54
Function 76. Debug Mode	54
Function 78. Initialize ID Memory	54
Function 79. Enable Multi-point Linearization	54
Function 80. Multi-point Linearization Calibration	55

DIAGNOSTIC TESTS	**56**
Table of Diagnostic Tests	56
Diagnostic Test 1: Serial com Port 1 (Display Input Data)	56
Diagnostic Test 2: Serial com Port 1 (Display Errors)	57
Diagnostic Test 3: Serial com Port 1 (Transmit Data)	57
Diagnostic Test 4: Serial com Port 2 (Display Input Data)	57
Diagnostic Test 5: Serial com Port 2 (Display Errors)	57
Diagnostic Test 6: Serial com Port 2 (Transmit Data)	57
Diagnostic Test 7: Not used	58
Diagnostic Test 8: A to D Test	58
Diagnostic Test 9: Memory Test	58
Diagnostic Test 10: Lamp Test	58
Diagnostic Test 11: Print EAROM Configuration Table	59
Diagnostic Test 12: Loop Back Tests (Serial Port1)	59
Diagnostic Test 13: Loop Back Test (Serial Port 2)	59
TROUBLE SHOOTING	**60**
Problems and Probable Causes	60
Error Messages	61
HARDWARE INSTALLATION AND WIRING	**62**
Load Cell Connector - TB1	62
Power Source AC/DC	62
I/O Port Connector - TB3	62
P.C. Board Diagram – Connectors, Jumpers and Switches	63
Isolated Analog Output Option - 0-5/10 VDC/4-20mA	64
Analog Output Offset	64
Analog Output Span	64
Analog Output Register	64
ASCII II Chart	65
SPECIFICATIONS	**66**

Introduction

Congratulations on your purchase and welcome to the AD-5200 & AD-5300 User's Manual. This manual describes the installation, calibration and setup, and operation of the AD-5200 & AD-5300 weigh scale indicator. The AD-5200 & AD-5300 is a microprocessor based weight indicator with rugged design and state-of-the-art technology. It is designed for use in industrial environments to perform the following functions:

- Analog to Digital conversion (A/D) - converts the analog signal from a strain gauge "load cell" to a numeric weight.
- Signal Processing - filters electrical and mechanical noise from the load cell signal using electronic circuits and digital filtering.
- Basic Weighing - push button zero, tare functions (push button and keyboard tare), display of gross or net weight and scale status, and transmission of weight data to a printer and a computer.
- Additional Functions - trip level event monitor, programmable "Scale Basic" functions, TTL level 'setpoint' inputs and outputs, and remote control via TTL inputs or RS232 serial input.

The AD-5200 & AD-5300 have two bi-directional serial communication ports that are used for printer output, bar code input, computer communications, and remote control. The serial ports support RS232, RS422, RS485, and 20ma Current Loop communication.

The AD-5200 & AD-5300 have one digital TTL I/O port. The TTL inputs can be used for remote control (ZERO, TARE, GROSS/NET, PRINT) the outputs can be used for control.

Options available include high-speed 100 samples per second, networking, analog output, solid-state relay board module and counting program.

What's In Each Section

This manual is organized and divided into separate sections, which describe the installation, calibration, setup, operation, and testing of the AD-5200 & AD-5300. Some Sections, such as **Installation, Setup** and **Calibration** are intended for trained scale technicians familiar with the installation of computer equipment. Other sections present information applicable to a user, installer, or system integrator.

The importance of certain information in various sections depends on what features of the AD-5200 & AD-5300 are to be utilized. It is recommended that each installer and user review all sections of the manual and determine what information is useful to his personal needs.

Installation and Setup allow a user to quickly get the AD-5200 & AD-5300 in a working manner for simple use and testing.

Set Operation Parameters and **Parameter Functions** concentrate upon additional versatile scale setup parameters and interfacing to peripheral devices such as printers, computer, PLCs, remote displays/scoreboards, etc.

Diagnostic Tests and **Troubleshooting** supply fast and simple diagnostic and troubleshooting instructions for virtually any abnormal situation.

Hardware and Wiring Diagrams provides all external-wiring instructions.

Scale Basic / Event Monitor Programming

The AD-5200 & AD-5300 Indicators offer "Scale Basic" programming capabilities, which allow you to customize the operation of the AD-5200 & AD-5300 to your application. Scale Basic is designed to be similar to the common BASIC language used in computer programming.

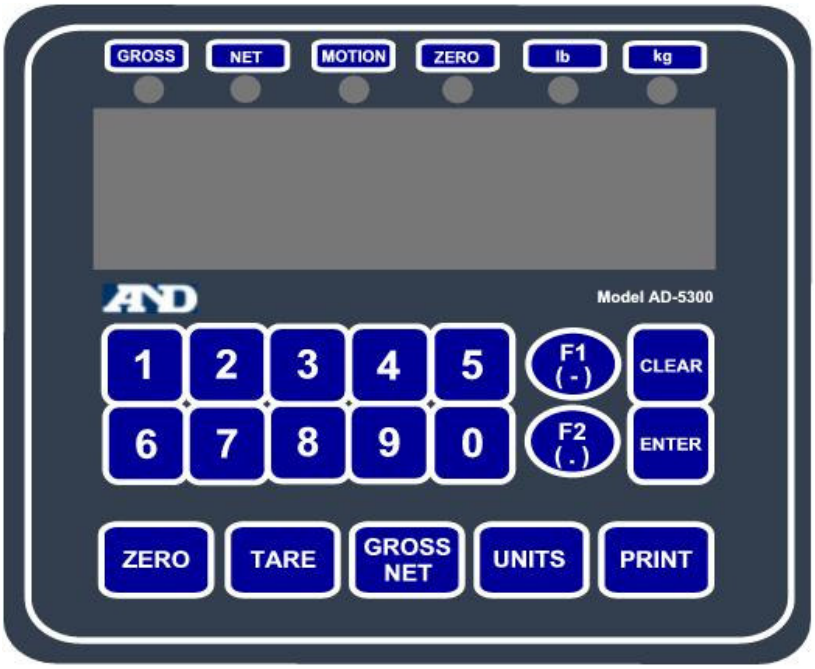
Event Monitors work with Scale Basic functions to provide event driven programming capabilities, such as activating setpoint relays. Events trigger actions; Event Monitors activate Scale Basic functions.

A Scale Basic & Event Monitor Programming Manual may be obtained through your Dealer

General Description

This section gives you a general description on the operation of the AD-5200 & AD-5300 keyboard and display. The keyboard is used to initiate weighing functions, for data entry, maintenance, setup, and testing. The numeric display is used for weight and error display and for data entry. The LED status lights indicate the status of the weigh scale. Additional information about the keyboard and display is provided in section: **Using the AD-5200 & AD-5300**.

AD-5200 & AD-5300 **Display and Keyboard Diagram**



The AD-5200 & AD-5300 Display

The AD-5200 & AD-5300 DISPLAY consists of a 6 character NUMERIC display and 6 status LED's The NUMERIC display is normally used to display the weight on the scale. The LED's display the scale status. When lighted they indicate the following conditions:

GROSS-	The number displayed is the gross weight on the scale.
NET -	The number displayed is the net weight on the scale.
MOTION-	The weight on the scale is changing (not stable).
ZERO-	The scale is at "Center of Zero".
lb-	The weight displayed is in increments of pounds.
kg-	The weight displayed is in increments of kilograms.

The AD-5200 & AD-5300 Keyboard

The keyboard is used to initiate weighing functions and for data input and setup of the AD-5200 & AD-5300. It is divided into 3 sections: Numeric Keypad, Function Keys, and Control keys as shown on the previous page.

Numeric Keypad

The numeric keypad is used for numeric data entry. Alphanumeric entry is performed using a three-digit code for every alphanumeric character. Some system parameters may require alphanumeric entry. Instructions for alphanumeric entry are provided where needed.

Control Keys

The function keys ZERO, TARE, GROSS/NET, UNITS and PRINT are used to perform the functions of zeroing the scale, tarring the scale, switching the weight display between gross and net display, switching the weight display between LB and KG display, and printing the weight. The function keys F1 and F2 are programmable using Scale Basic functions.

Function Keys

The control keys ENTER, and CLEAR are used to control the data entry operations for ID's, setpoints and setup.

Installation and Setup

This section provides information about unpacking, installing, and setup of the AD-5200 & AD-5300. It also directs the installer to the appropriate sections of the manual for hardware and setup installation.

Unpacking the AD-5200 & AD-5300

Installation begins with unpacking. Observe any instructions or cautions, which appear in the shipping container. Check the items in the shipping container against the following item check list or the packing list. A&D will not accept responsibility for shortages against the packing list unless notified within 30 days. All equipment and accessories are inspected and tested before shipment. Inspect the equipment carefully. If shipping damage is evident, notify the carrier immediately. Take photographs if necessary. You are responsible for final claim and negotiations with the carrier. Save the packing and shipping container in case you need to store, return, or transport the AD-5200 & AD-5300 for any reason.

Item check list

- AD-5200 or AD-5300 - Weight Scale Indicator
- Power cord
- This user's manual, Scale Basic manual and quick reference guide
- Capacity labels

NOTE: The container may include additional items that have been purchased separately.

Installation Guide

Connect AD-5200 or AD-5300 to load cell

Connect the load cell to the Load Cell Terminal Block located inside the enclosure. See the HARDWARE INSTALLATION AND WIRING section for pin assignments and a sample cable drawing.

Connect AD-5200 or AD-5300 to the printer (optional)

The AD-5200 OR AD-5300 can be connected to a printer using Com Port 1 (TB3) for RS232, Current Loop or RS485 interfaces or by using the TTL I/O Port (TB4) for TTL compatible interfaces. See **Hardware and Wiring Diagrams** for pin assignments and sample cable drawings. See **Set Operation Parameters**, and **Parameter Functions** for other communication setup parameters.

Connect AD-5200 OR AD-5300 to host device (optional)
The Serial Communications Port 2 (TB3) provides a continuous output of scale data. This is used for connection to a host device such as a computer or to a remote display (scoreboard). Continuous output transmission can be enabled or disabled and the output format can be customized to interface with the host device. **See Hardware and Wiring Diagrams** for pin assignments and sample cable drawings. See **Set Operation Parameters**, and **Parameter Functions** for other communication setup parameters.

Apply AC Power to the AD-5200 OR AD-5300
After the load cell and optional equipment has been connected, apply power through the power cord.

Note: The socket outlet should be installed near the equipment and shall be easily accessible.

On power-up, the AD-5200 & AD-5300 perform the following tests:

1. A/D Conversion Test - the AD-5200 & AD-5300 verify that A/D conversions are taking place.
2. Keyboard Scan - the keyboard is scanned to verify that no keys are engaged.
3. Memory Test - the AD-5200 & AD-5300 display "rTEST" while it performs a memory test on internal memory. If a problem is encountered during the test, an error message is displayed.
4. Lamp Test - all segments on the numeric display and all LED's are turned on for 5 seconds.
5. Conversion Display - the AD-5200 & AD-5300 display "Ad xxx", where "xxx" is the conversion count. This test takes approximately 10 seconds.
6. Stability Check - the AD-5200 & AD-5300 display "C xxxx" where "xxxx" is the raw data difference in scale readings. The AD-5200 & AD-5300 wait until the data difference is within a stable range.

To exit the above power on test functions, press the CLEAR key during any test. This is possible only if the AD-5200 & AD-5300 have not been locked.

The AD-5200 & AD-5300 are now ready for **initialization**, calibration, and configuration. Continue with Setup Guide.

Setup Guide

Initialize to Factory Defaults

Setup the AD-5200 & AD-5300 in the following order:

The AD-5200 & AD-5300 are initialized at the factory. The AD-5200 & AD-5300 should be initialized when first powered up to guarantee no corruption occurred during shipping. It must be re-initialized if the program memory (EPROM) or the parameter memory (EAROM) is replaced. The Initialize function clears the memory and sets the configuration parameters to their default values. Use parameter function 70 described in **Parameter Functions** section (Page 7-7) to initialize the AD-5200 & AD-5300.

NOTE: Use the code 10809 for a factory default initialization. Calibration and setup must be performed after the AD-5200 & AD-5300 are initialized with this code.

Setup & "Quick" Calibration Guide

The AD-5200 & AD-5300 should be configured after initializing and **BEFORE** calibration. **Set Operation Parameters** details all of the scale parameters that are available. To quickly get the AD-5200 & AD-5300 up and running, the following Quick Calibration Guide lists only the mandatory parameters that must be defined. Enter the following scale parameters using the selection outlined in **Set Operation Parameters** and **Parameter Functions**.

Parameter (section)	Purpose (Factory Setting)
1 (Set Operation Parameters)	Load Cell mv/V (3)
11 (Set Operation Parameters)	Decimal Point (none)
12 (Set Operation Parameters)	Count-by (1)
17 (Set Operation Parameters)	Full Scale Graduations (10,000)
18 (Set Operation Parameters)	Overload Graduations (10,200)
60 (Parameter Functions)	Calibrate Scale

Calibrate the Weight Indicator

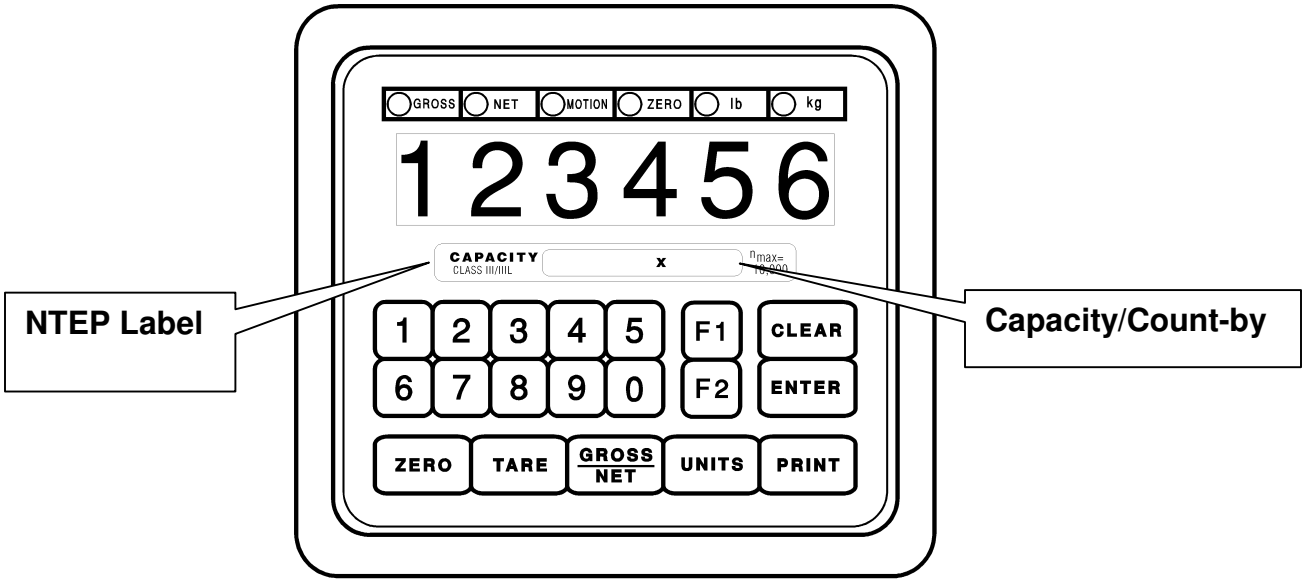
Use Parameter Function 60 to calibrate the weight indicator.

NTEP LABELING INSTRUCTIONS

Labeling Guidelines For NTEP Applications

These guidelines pertain to the use of the AD-5200 & AD-5300 in NTEP (National Type Evaluation Program) applications. If you are unfamiliar with NTEP, it is probable that this information can be disregarded for your application.

NTEP has implications for “Legal-For-Trade” requirements only. These requirements generally pertain to weighing scales that must be certified as accurate by local, state and federal Weights and Measures officials.



For installations that are to be certified as “Legal-For-Trade”, install the NTEP label approximately as shown.

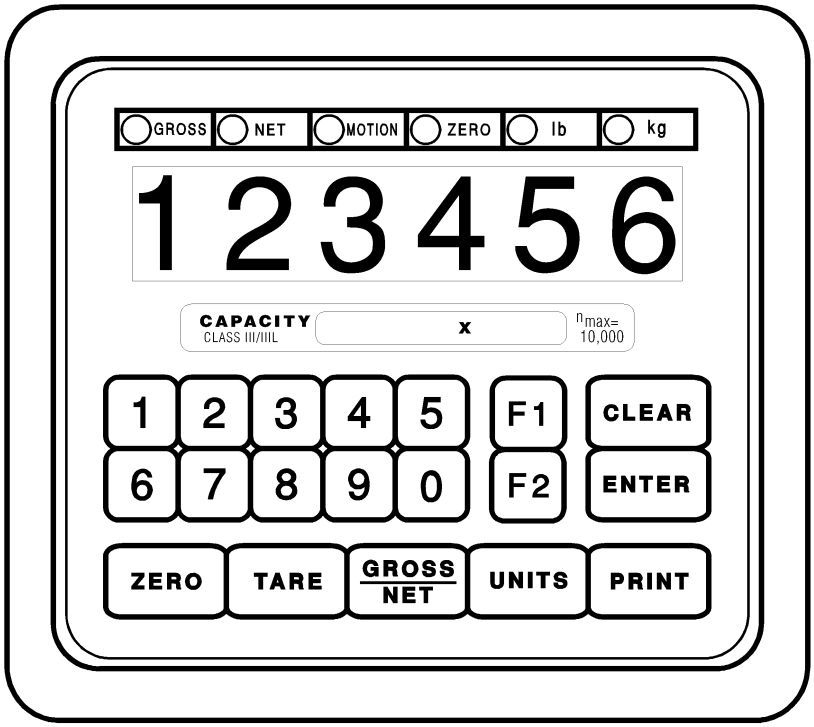
The label consists of two parts, the label and the backing material. Carefully remove the backing from the label and affix the label to the AD-5200 or AD-5300 in the position indicated above.

Label text must be inserted by the user/installer in the space provided to reflect the scale/weighing system capacity and minimum display increment (count-by). A permanent ink marking pen or matte-finish vinyl lettering is recommended for this purpose. After the appropriate information is in place, apply one of the supplied transparent overlays to protect the complete label.

Using the AD-5200 & AD-5300

The AD-5200 & AD-5300 have 7 programmable function keys on the keyboard, a numeric keypad and 2 control keys (ENTER and CLEAR). This section of the AD-5200 & AD-5300 manual describes what the keys are used for and how to use them.

Keyboard Layout



Operation of Function Keys

The programmable function keys are located on the AD-5200 & AD-5300 front panel, including the F1 and F2 keys. The following are default settings but they can be programmed to execute a number of functions.

Zero

Press the ZERO key to zero the scale. The following conditions must be met for the ZERO key to function:

- The gross weight is within the configured zero acquisition range: 1% to 100% of full scale.
- The scale is stable (no motion).

Tare

AUTO TARE:

Press the TARE key. The AD-5200 & AD-5300 read the weight on the scale and

store it in the tare register. The AD-5200 & AD-5300 switch to NET mode and displays the net weight.

KEYBOARD TARE:
Use the numeric keys to enter a tare weight. Press the TARE key. The AD-5200 & AD-5300 store the entered weight in the tare register and switch to NET mode and displays the net weight.

CLEAR TARE:
Press the numeric ZERO key. Press the TARE key. The tare weight is cleared to zero and the AD-5200 & AD-5300 switch to the GROSS mode displaying the gross weight.

Gross/Net
Press the GROSS/NET key to alternate between Gross and Net display modes.

Print
Press the PRINT key to print weight data. Page format 1 is printed if the AD-5200 & AD-5300 are in Gross display mode and page format 2 is printed in the Net display mode. See the **Parameter Functions** section for setup of print formats.

F1 and F2
The F1and F2 keys can be configured to execute any scale basic function, see (parameters 57 and 58 to set the key functions).

When the indicator is in data entry mode, the F1 key can be used for entering a minus sign; the F2 key can be used to enter a decimal point.

Memory Register Entry
Use the numeric keypad to enter the memory register number (1 to 16). Press the ENTER key. The AD-5200 & AD-5300 display "reg xx" for 1 second and then displays the current memory register value. Press the CLEAR key if no change is to be made or enter a new value and then press the ENTER key. Memory registers are used by the Event Monitor to calculate setpoint values store weight data and execute math functions.

NOTE: memory registers are set to zero at power up unless the battery back up is enabled CFG 41.

Execute a Scale Basic Function
The AD-5200 & AD-5300 provide up to 16 user programmable functions. User programs 1 thru 16 can be executed by entering 1 to 16 respectively for the key function parameter (CFG parameters 51 – 58). See the "Scale Basic / Event Monitor" manual or quick reference guide for more information.

Display Time/Date
Enter 19 to display the time. Press ENTER to display the date. Press ENTER again to return to Gross or Net display mode.

Built In Application Programs

The following built in programs are available to enable:

1. Fill to Setpoint.
2. Checkweigh: Under/Between/Over.
3. Weigh-in / Weigh-out.
4. Axle Weigh/Container weighing – Short Scale.
5. Axle Weigh – Long Scale.
6. ID Tare and Total.
7. Peak Hold.

Use parameter function 73, “Initialize Function Memory”, to activate a built in program. See page 53 CFG 73 for more details.

The initialize function erases function memory and setpoint monitor memory, and initializes all parameters that have a password level of 1 or 2. Use parameter function 73 before configuring parameters with a password level of 1 or 2.

1 Fill to Setpoint

Press the F1 key, the display prompts “SEt Pt” key in the setpoint value and depress the Enter key. Place an empty container on the scale. Press the F2 key to begin filling. TTL output 1 turns on until the weight on the scale is equal or greater than the setpoint.

Connect TTL out put 1 to a relay to turn on motors, open and close gates, turn on and off flow valves for automated filling or indication.

Installation

Connect TTL output 1 to relay or lamp actuator.

TB4 - Pin 1 = TTL output 1 (active low) +5volts idle, 0 volts active.
TB3 - Pin 1 = +5 volts

Setup Parameters:

(See chapter 6: Set Operation Parameters for setup details)

Parameter 43 Minimum scale weight to begin filling. Verifies that a container is on the scale. Defaults to 0 = there is no minimum.
Parameter 44 Minimum fill amount. Defaults to 0. Set to some small value to insure that a fill amount has been entered.
Parameter 45 Maximum fill amount. Default 5000. Maximum fill weight that will ever be used.
Parameter 46 Scale empty weight. Default 50. Maximum weight to begin fill. Verifies that an empty container is on the scale.

Operators Functions

Enter setpoint

Press **F1** key to enter the setpoint. Enter the setpoint weight, then press the ENTER key.

Start fill operation

Place the container on the scale (if required). Press **F2** key to begin fill operation.

Stop fill operations

Press the **Clear** key to stop fill operation.

Print Results

Press the Print key to print the Gross, Tare, and Net results of the fill operation.

Error Codes

Error 30 = Scale not empty
Error 31 = Minimum weight error: container is not on scale
Error 32 = Tare weight error: tare function failed, scale not stable (motion)
Error 33 = Setpoint less than minimum setpoint amount
Error 34 = Setpoint more than maximum setpoint amount

2 Checkweigh: Under/Between/Over

The indicator monitors the scale for activity, when the scale goes above the 'empty' weight, the indicator waits for a stable weight, and then outputs an indication of Under, Between (OK), or over. The cycle resets when the scale goes below the empty weight.

Installation

Connect TTL outputs to relays or lamp actuators.

Under weight indication	TTL 1	TB4 - Pin 1
Between weight indication	TTL 2	TB4 - Pin 2
Over weight indication	TTL 3	TB4 - Pin 3
Ground	GND	TB4 - Pin 4
+ 5 volts DC	+5v	TB3 - Pin 1

Configure 'empty' scale weight. (Parameter 43)

Operators Functions

Enter setpoint weights

Press the F1 key. The display prompts "SP 1. Use the numeric keyboard to enter setpoint 1, then press the ENTER key. The display prompts "SP 2". Use the numeric keyboard to enter setpoint 2, then press the ENTER key. NOTE: use the F2 key to enter a decimal point if needed.

Recalculate

Press the F2 key to re-check the weight on the scale after adjustments have been made to the weight.

3 Weigh-in / Weigh-out

This program uses the ID memory for weigh-in / weigh-out transactions. An ID record is created using the Weigh-in function. The Weigh-out function recalls the ID, calculates Gross/Tare/Net of the transaction, prints the transaction, and adds the net weight to the ID's totals register. The ID data is saved for further weigh-in/weigh-out transactions, or weigh-out only transactions. A sequential transaction number is maintained for printing purposes.

Weigh-In

Press the **F1** key. The display prompts "id". Enter up to 8 digits for the weigh-in ID and then press the ENTER key. The scale weight is stored in the ID's tare register and print page 3 is sent to the printer. If the ID has been weighed in but not weighed-out then "Err 20" is displayed. Press the CLEAR key to exit without changing the ID data, press the ENTER key to enter the new ID data.

Weigh-Out

Press the **F2** key. The display prompts "id". Enter up to 8 digits for the weigh-out ID and then press the ENTER key. The indicator recalls the ID from memory, calculates the gross, tare and net weights, totals the net weight and sends the weigh-out data (page 2) to the printer. If an ID is entered that is not found in memory the displays "Err 21". Press the CLEAR key to exit the weigh-out function.

The print formats label "(IN) GROSS" for weigh-in gross transactions, "(IN) TARE" for weigh-in tare transactions, and "MEM TARE" to designate Memory tare for ID's recalled 2 or more times.

Print ID's, Display ID's, Clear Totals, Erase ID's

Entering ID 0 accesses the ID maintenance functions. Press the F1 (or F2) key, press the numeric 0 key, and then press the ENTER key. The display prompts "rePort". Press the UNITS (↓) key or the PRINT (↑) key to scroll through the ID file maintenance menu.

REPORT: Press the ENTER key when the display prompts "rePort". The display then prompts "id". Enter an ID number to be printed or enter the numeric 0 to print all ID's and depress the enter key and report will be printed on port 1.

DISPLAY ID's: Press the ENTER key when the display prompts "diSPLA". The display then prompts "id". Enter an ID number to display the data in its registers, or enter 0 and then the ENTER key to scan ID memory.

CLEAR TOTALS: Press the ENTER key when "CLEAr" is displayed. The display prompts "id". Enter an ID number to clear or enter the numeric 0 to clear all ID totals and depress the ENTER key.

ERASE ID'S: Press the ENTER key when the display prompts "ErASE". The display then prompts "id". Enter an ID to be erased or enter the numeric 0 to erase all ID's and depress the ENTER key.

REBUILD ID MEMORY: Press the ENTER key when the display prompts, “rebuiLd”. The display then prompts “id”. Enter the numeric 0 then press ENTER to rebuild ID memory.

COUNT UNUSED ID’S: Press the ENTER key when the display prompts “Count”. The display prompts “FrExxx” where xxx is the number of unused ID records in memory.

Set Beginning Sequence Number
Depress the number 9 key and then the ENTER key. The display prompts "reg 9" for 1 second and then displays the current value. Press the CLEAR key if no change is to be made, or enter a new value and then press the ENTER key. The next sequence number printed will be the entered value +1.

Options
- **Print key**: Set parameter 52 = 4 (execute user function 4) to enable the print key to print the weight on the scale. The print data is sent to Serial Communications Port 1. If units other than lb are used, change print label 85 to the correct units.
- **Unit’s key**: Set parameter 53 = 127 (execute Units function) if weighing of dual units is required.

Notes
- The ID file maintenance functions are password level 1 protected. If a password has been configured (function 64) the operator will be prompted for the password before the file maintenance menu is displayed.
- ID memory is cleared to zero at power up unless CFG parameter 41 (battery back up enable) is set to 1.

4 Axle Weigh – Short Scale

Automatically weigh multiple axles (or containers), print each axle weight, and print axle (or containers) total.

Installation

Connect the Red light / Green light relays.

Green light =	TTL out 1	TB4 Pin 1
Red light =	TTL out 2	TB4 Pin 2
Ground =	GND	TB4 - Pin 4
+ 5 volts DC	+5v	TB3 - Pin 1

Setup Parameters

Configure the following parameters:

Parameter 43	Trip level weight. Determines when an axle is on the scale.
Parameter 74, 1	Red light turn delay timer. This provides a delay time before the Red light output is turned on.
Parameter 74, 2	Green light turn delay timer. The amount of delay time before the Green light is turned on.
Parameter 74, 3	Finish timer. Amount of time to wait before automatically activating the finish print function.

Operator Functions

The unit is capable of operating unattended, with no operator intervention. The indicator determines when an axle is on the scale by the increase (or decrease) of weight on the scale.

A finish timer (parameter 74-3) determines when to complete a weigh cycle (print total and wait for empty scale).

Press the F1 key to manually finish a weigh cycle before finish timer has timed out.

Press the F2 key to abort the weigh cycle.

5 Axle Weigh – Long Scale, Unattended

Automatically weigh multiple axles (or containers), print each axle weight, and print axle (or containers) total.

Installation

Connect the Red light / Green light relays.

Green light =	TTL out 1	TB4 pin 1
Red light =	TTL out 2	TB4 pin 2
Ground =	GND	TB4 - Pin 4
+ 5 volts DC	+5v	TB3 - Pin 1

Setup Parameters

Configure the following parameters:

Parameter 43 Trip level weight. Determines when an axle is on the scale.

Parameter 74, 1 Red light turn delay timer. This provides a delay time before the Red light output is turned on.

Parameter 74, 2 Green light turn delay timer. The amount of delay time before the Green light is turned on.

Parameter 74, 3 Finish timers. Amount of time to wait before automatically activating the finish function.

Operator Functions

The unit is capable of operating unattended, with no operator intervention. The indicator determines when an axle is on the scale by the increase of weight on the scale.

A finish timer (parameter 74-3) determines when to complete a weigh cycle (print total and wait for empty scale).

Press the F1 key to manually finish a weigh cycle before finish timer has timed out.

Press the F2 key to abort the weigh cycle.

6 ID, Tare, and Total

This program uses the ID memory to store tare weights and totals.

Enter ID and Tare Data
Press the **F1** key. The display prompts "id". Enter up to 8 digits for ID and then press the ENTER key. The display prompts “tArE”. Enter the tare weight for that ID.

Recall ID and Tare
Press the **F2** key. The display prompts "id". Enter up to 8 digits for the weigh-out ID and then press the ENTER key. The indicator recalls the ID from memory and copies the ID tare to the tare register, depress the PRINT key.

The ID number, Gross, Tare, and Net are printed. The Net weight is added to the ID’s totals register.

Print ID’s, Display ID’s, Clear Totals, Erase ID’s
Entering ID 0 accesses the ID maintenance functions. Press the F1 (or F2) key, press the numeric 0 key, and then press the ENTER key. The display prompts "rePort". Press the UNITS (↓) key or the PRINT (↑) key to scroll through the ID file maintenance menu.

REPORT: Press the ENTER key when the display prompts "rePort". The display then prompts "id". Enter an ID number to be printed or enter the numeric 0 to print all ID's and depress the ENTER key.

DISPLAY ID’s: Press the ENTER key when the display prompts “diSPLA”. The display then prompts “id”. Enter an ID number to display the data in its registers, or enter 0 to scan ID memory and depress the ENTER key.

CLEAR TOTALS: Press the ENTER key when "CLEAr" is displayed. The display prompts "id". Enter an ID number to clear or enter the numeric 0 to clear all ID totals and depress the ENTER key.

ERASE ID'S: Press the ENTER key when the display prompts "ErASE". The display then prompts "id". Enter an ID to be erased or enter the numeric 0 to erase all ID's and depress the ENTER key.

REBUILD ID MEMORY: Press the ENTER key when the display prompts, “rebuiLd”. The display then prompts “id”. Enter the numeric 0 then press ENTER to rebuild ID memory.

COUNT UNUSED ID’S: Press the ENTER key when the display prompts “Count”. The display prompts “FrExxx” where xxx is the number of unused ID records in memory.

Set Beginning Sequence Number
Use the numeric keypad to enter number 1. The display prompts "reg 1" for 1 second and then displays the current value. Press the CLEAR key if no change is to be made, or enter a new value and then press the ENTER key. The next sequence number printed will be the entered value +1.

Notes

- The ID file maintenance functions are password level 1 protected. If a password has been configured (function 64) the operator will be prompted for the password before the file maintenance menu is displayed.
- ID memory is cleared to zero at power up unless parameter 41 (battery back up enable) is set to 1.
- Maximum amount of ID's 529.

7 Peak Hold Function

The peak hold register maintains the peak weight detected by the weight indicator.

Enable Peak Hold

Access configuration parameter 75. Enter a 1 to enable peak hold, enter a 0 to disable peak hold.

Clear Peak Hold Register

Press the CLEAR key to reset the peak hold register to 0.

Use the Scale Basic built in function Clear Peak [143] to reset the peak hold register.

Display Peak Weight

Use the GROSS/NET key to scroll thru the display options as follows:

Initial mode:	Display gross weight.	Gross LED on.
First GROSS/NET press:	Display net weight.	Net LED on.
Next GROSS/NET press:	Display gross peak weight.	Gross LED flashing.
Next GROSS/NET press:	Display net peak weight.	Net LED flashing.
Next GROSS/NET press:	Display gross weight.	Gross LED on.
Etc.		

Print Peak Weight

Use function 65 (Configure Print Formats) to format the print output using page 1:

Print Item 19: Print Gross Peak weight on page 1.

Print Item 20: Print Net Peak weight on page 1.

Set Operation Parameters

This section describes the operation parameters of the AD-5200 & AD-5300 and how the settings affect the operation of the weight indicator.

Access Operation Parameters and Parameter Functions

The parameters are accessed by holding the CLEAR key down and then pressing the ENTER key. The numeric display will prompt "CFG xx" where xx is the currently selected parameter. Enter the parameter number to be modified and then press the ENTER key. NOTE: the UNITS key (↓) and the PRINT key (↑) can be used to scroll the CFG parameter number. Press the UNITS key to increment the CFG number, press the PRINT key to decrement the CFG number.

To exit configuration and store changes, press the CLEAR key when "CFG xx" is being displayed.

To exit configuration and NOT store changes, enter 999 when "CFG xx" is being displayed. The display prompts "Abort". Press the ENTER key to abort (exit without saving changes) or press the CLEAR key if you do not want to abort.

Operation Parameters Reference Tables

The reference tables provide an overview of the operation parameters. The sections following the reference tables describe the setup parameters in detail and the procedures for modifying them. Use the 'Field Settings' column of the reference tables to document any changes to the setup parameters.

Reference Table column headings descriptions:

- **No**.: Use this number to access the parameter to be modified. For example to modify the Digital Filter enter CFG 2.
- **Parameter Name**: The name of the parameter.
- **Default**: The value set at the factory. The Parameter Function "Initialize Operation Parameters to Factory Defaults" sets the parameter to this value.
- **Max Value**: The maximum value for numeric parameters, the maximum number of characters for alphanumeric parameters.
- **Pass**: The AD-5200 & AD-5300 have 4 password levels. Level 1 requires entering password-1 before accessing the parameter. Level 2 requires password-2. Level 3 requires password-2 and the Lock Switch to be in the unlocked position. Level 4 inhibits Scale Basic functions from being uploaded to a PC.
- **Field Setting**: Record any changes to the parameters in the Field Setting column.

Scale Parameters

No	Parameter Name	Default	Max Value	Pas	Field Setting
1	Loadcell mv/v	3	4	3	
2	Digital filter	9	18	3	
3	Display Update Rate	1	200	3	
4	Motion delay time	6	250	3	
5	Motion band	6	250	3	
6	Motion blanks display	0 (no)	1	3	
7	Zero tracking delay	0	250	3	
8	Zero tracking band	12	250	3	
9	Push button zero percent	100	100	3	
10	Primary units type	1 (lb)	6(oz)	3	
11	Decimal point position	0	4	3	
12	Count-by	1	100	3	
13	Alternate units type	2 (kg)	6(oz)	3	
14	Alt decimal point	1	4	3	
15	Alternate count-by	5	100	3	
16	Alt conversion factor	45,360		3	
17	Full Scale display digits	10,000	120,000	3	
18	Over Weight dd	10,200	120,200	3	
19	Deadload offset			3	
20	Disable Power-On Zero	1	1	3	
21	Deadload Factor			3	
22	Weight conversion fact.			3	

I/O Port Parameters

No	Parameter Name	Default	Max Value	Pas	Field Setting
23	Serial port 1 mode	4(8N1)	6	2	
24	Serial port 1 baud rate	1(9600)	6	2	
25	Serial port 2 mode	4(8N1)	6	2	
26	Serial port 2 baud rate	1(9600)	6	2	
27	TX2 control / Station Id	255	255	1	
28	TX2 Data Format	1 (AND)	4	2	
29	Printer port select	2 (Com1)	2	2	
30	Auto print LF after CR	1 (yes)	1	2	
31	End Of Print character	13 (cr)	255	2	
32	Print label 32		16 char	2	
33	Print label 33		16 char	2	
34	Print label 34		16 char	2	
84	Print label 84		30 char	2	
85	Print label 85		30 char	2	
86	Print label 86		30 char	2	
87	Print label 87		30 char	2	
88	Print label 88		30 char	2	
89	Print label 89		30 char	2	
90	Print label 90		30 char	2	
35	Print code 1		3 codes	2	
36	Print code 2		3 codes	2	
37	Print code 3		3 codes	2	
38	Print code 4		3 codes	2	
39	TTL remote control	1 (yes)	1	2	

Display Intensity, Battery, Watchdog Timer

No	Parameter Name	Default	Max Value	Pas	Field Setting
40	Display intensity	10	15	2	
41	Battery backup enable	0 (no)	1	2	
42	Enable watch dog timer	1 (yes)	1	1	

Fixed Setpoints

No	Parameter Name	Default	Max Value	Pas	Field Setting
43	Fixed setpoint 43	0		1	
44	Fixed setpoint 44	0		1	
45	Fixed setpoint 45	0		1	
46	Fixed setpoint 46	0		1	
47	Fixed setpoint 47	0		1	
48	Fixed setpoint 48	0		1	
49	Fixed setpoint 49	0		1	
50	Fixed setpoint 50	0		1	

Keyboard Events

No	Parameter Name	Default	Max Value	Pas	Field Setting
51	Power on start	0	255	2	
52	PRINT key	136	255	2	
53	UNITS key	127	255	2	
54	Gross/Net key	128	255	2	
55	TARE key	129	255	2	
56	ZERO key	130	255	2	
57	F1 key	138	255	2	
58	F2 key	139	255	2	

Parameter Functions

Fn. No	Function Name	Password Level
59	Display Calibration Audit Number	0
60	Calibrate Scale - Deadload first	3
61	Calibrate Scale - span first	3
62	Calibrate Deadload Only	3
63	Adjust Gain Calibration	3
64	Configure Passwords	2
65	Configure Print Formats	2
66	Set Time and Date	2
67	Display Operation Parameters	0
68	Print Operation Parameters	0
69	Diagnostic Tests	0
70	Initialize Operation Parameters to factory defaults.	3
71	Configure Event Monitor	2
72	Function Editor	2&3
73	Initialize Function Memory	2
74	Set Debug mode for Event monitors and Scale basic fns.	2
75	Enable Peak Detect (optional)	2
76	Set debug mode for event monitors and scale basic fns.	2
78	Erase Id Memory	1
79	Enable Multi-point Linearization (default = disabled [0])	3
80	Calibrate using Multi-point Linearization	3
81	Analog output span (default = 10,000)	1
82	Analog output offset (default = 0)	1
83	Analog output register (default = 0 [disabled])	1

Scale Parameters

The scale parameters configure the AD-5200 & AD-5300 for the weigh platform or load cell that is connected. The preceding table titled “SCALE PARAMETERS” lists the scale parameters and their factory settings. Use the “Field Setting” column to record any changes made to the factory default values.

Many of the following parameters are entered in terms of “graduations”. The full-scale graduations can be found by dividing the full-scale weight by the count-by weight. For example, if the scale is configured for 500.00kg x 0.05kg, the full-scale graduations is 500.00/0.05 = 10,000 graduations to full scale.

The numbers in parenthesis are the default factory settings.

Parameter 1. Load Cell mv/V (3 mv/v)

The AD-5200 & AD-5300 can be used with load cell outputs of 1 mv/V, 2 mv/V, or 3 mv/V. Enter a 1, 2, or 3 for the load cell type used in your application.

Setting	A/D gain
0	200
1 mV/v	100
2 mV/v	100
3 mV/v	50
4	25

Parameter 2. Digital Filter (9)

The digital filter removes scale vibrations and other noise signals from the weight display. The filter range is between 0 and 18. A setting of 0 provides no filtering; a setting of 18 provides maximum filtering. The higher the filter number, the longer the settle time of the weight display. For example:

Filter Setting	Settle Time
3	0.4 sec
6	0.8 sec
9	1.75 sec
12	3.5 sec
15	7.0 sec

Use the smallest filter setting that provides satisfactory display stability.

Parameter 3. Display Update Rate (1)

Enter the time between display updates (in tenths of a second). An update rate of 1 causes a 0.1 second delay between display updates, a rate of 200 causes a 20 second delay between updates. NOTE: motion detection is calculated using the weight values of the display rate. If the update rate is 50, the motion calculation is based on weight readings sampled at 0.5sec intervals.

Parameter 4. Motion Detection Delay (6)
Motion detection delay is used by the motion detection function to determine if the scale is in motion (not stable). Enter the amount of time (in tenths of a second) that the scale must be stable for motion status to be false (scale status = stable).

Example: 0 = disables motion detection.
2 = 0.2 second delay before motion = false (stable = true).
15 = 1.5 second delay.
30 = 3.0 second delay.

Parameter 5. Motion Detection Band (6)
The motion band is used by the MOTION DETECT function to determine if the scale is in motion (not stable). If the amount of change between display updates (parameter 2) is greater than the motion band, a MOTION status is generated (unstable condition). The motion band is entered in units of ¼ dd, i.e.. For a motion band of:

½ display division enter 2	½ x 4 = 2.
2 display divisions enter 8	2 x 4 = 8.
4.5 display divisions enter 18	4.5 x 4 = 18.

Parameter 6. Display Blanking During Motion (No Blanking)
When display blanking is enabled, the display is blanked (turned off) when the scale is in motion (not stable). Enter a 1 (yes) to enable display blanking, enter a 0 (no) to disable display blanking.

Parameter 7. Zero Tracking Delay (0)
The automatic zero tracking function removes small deviations from zero. The AD-5200 & AD-5300 adjust the zero setting by approximately 1/30th of a display digit per delay interval. The delay interval is the number effective A/D conversions between adjustments.

Parameter 8. Zero tracking band (12)
The zero tracking band is the maximum displacement from zero wherein zero tracking is active. In order for zero tracking to be active, the following conditions must be met:

- Scale weight is within Zero Track Band.
- Scale is stable (no motion)
- Zero Track Band is greater than 0 (zero).

The zero tracking bands are entered in units of ¼ dd, i.e.. For a band of:

½ display division enter 2	½ x 4 = 2.
2 display divisions enter 8	2 x 4 = 8.
4.5 display divisions enter 18	4.5 x 4 = 18

Parameter 9. Push Button Zero Percent (100)
Enter the percent of full-scale capacity that can be acquired as the zero point with the ZERO key. 1 = 1%, 2 = 2%, ... 100 = 100%.

Parameter 10. Primary Units Type (1 [lb])
The scale is calibrated in the primary units. The UNITS key is used to toggle the weight display between primary units and alternate units. Enter the number that corresponds with the primary units:

0 = UNDEFINED, no units printed
1 = lb
2 = kg
3 = ton
4 = ten
5 = gram
6 = oz
7 = use print label 32 for units
8 = use print code 1 for units

NOTE: when parameter 10 is changed, parameters 13 and 16 must be programmed.

Parameter 11. Decimal Point Position (0 [no decimal point])
Enter the decimal point position for the primary units display. For example, if the scale is calibrated x 0.05 the decimal position = 2.

Parameter 12. Count-by (1)
Enter the primary units count-by. For example, if the scale is configured for:

x 0.05	count-by = 5
x 0.2	count-by = 2
x 1	count-by = 1
x 5	count-by = 5
x 50	count-by = 50

Note: the entry for 0.05 and 5 is the same. The decimal point position (parameter 11) differentiates between the count-by 0.05 and count-by 5.

Parameter 13. Alternate Units Type (2 [kg])
Alternate units are the alternate display and print unit of measure that can be used in addition to the primary units. The UNITS switch on the AD-5200 & AD-5300 keyboard toggles the weight display between primary units and secondary units.

0 = UNDEFINED, no units printed
1 = lb
2 = kg
3 = ton
4 = tne
5 = gram
6 = oz
7 = use print label 32 for units 8 = use print code 1 for units

Parameter 14. Alternate Decimal Point (1)
Enter the decimal point position for the alternate units display.

Parameter 15. Alternate Count-by (5)
Enter the alternate units count-by.

Parameter 16. Alt Units Conversion Factor (45,360)
The AD-5200 & AD-5300 calculate the alternate weight by multiplying the primary weight by the conversion factor and then dividing by 100,000. The following table lists some common conversions.

Alternate Units Conversion Factor Table

Conversion	Conversion Factor	Conv. Fact. x 100,000
lb to kg	0.45359 kg/lb	45,359
kg to lb	2.20462 lb/kg	220,462
lb to ton	0.0005 Ton/lb	50
kg to tonne	0.001 tonne/kg	100
gram to oz	0.352739 oz/gram	352,739
oz to gram	28.3495 gram/oz	2,834,950
lb to lb kb to kg Etc.	1	100,000

Enter the conversion factor x 100,000 for the configured alternate units.

Parameter 17. Full Scale Graduations (10,000)
Enter the number of graduations at full scale. The full-scale graduations are calculated using the count-by, decimal position, and full-scale weight.

Full Scale Graduations = Full Scale Weight / count-by.

For example, if Full Scale Weight = 600.0 and count-by = 0.2 then Full Scale Graduations = 600.0 / 0.2 = 3000.

Parameter 18. Overload Graduations (10,200)
Enter the number of graduations at which the scale is in overload status. The AD-5200 & AD-5300 display “Err oL” on the numeric display when the scale weight exceeds overload. For example, if the Full Scale Graduations is 10,000 grads and the scale is rated for 2% overload, then Overload Graduations = 10,000 + (10,000 x 0.02) = 10,200.

Parameter 19. Deadload Offset
This parameter is automatically calculated by the configure function (60 & 80).

Parameter 20. Disable Power-On Zero (1 [disabled])
Enter a 1 to disable the power-on zero function. Enter a 0 to enable power-on zero. The power-on zero function attempts to acquire zero when the power on tests have completed. If the weight on the scale is above the zero range the display prompts “Err 0”. Press the ENTER key to view the scale weight. Remove the weight from the scale to enter weighing mode.

Parameter 21. Deadload Factor
The deadload factor is automatically calculated by the calibration function. This parameter is not accessible from the keyboard.

Parameter 22. Weight Conversion Factor
The weight conversion factor is automatically calculated by the calibration function. This parameter is not accessible from the keyboard.

Serial I/O Ports

The AD-5200 & AD-5300 are equipped with two bi-directional serial communication ports that can communicate to an optional printer, a computer, bar code reader, a score board or other serial communication devices. The baud rate and format can be set independently for each port. Serial port 1 is normally used to output weight data and ID reports to a printer. Serial port 2 is normally used for continuous output of weight data. Continuous transmission can be enabled or disabled and the output format can be customized using Parameters 27 and 28.

Communication between serial devices requires that both devices have the same baud rate (transmission speed), data bit length, and parity. The mode parameter selects the data bit length and parity the baud parameter selects the baud rate.

Parameter 23 Serial Port 1 Mode (4 [8 data bits, no parity])
Enter the mode number from the table below to select the mode parameter in the mode description column.

Mode Number	Mode Description
1	7 data bits, no parity
2	7 data bits, even parity
3	7 data bits, odd parity
4	8 data bits, no parity
5	8 data bits, even parity
6	8 data bits, odd parity

Parameter 24 Serial Port 1 Baud Rate (1 [9600 baud])
Enter a baud number from the table below to select a baud rate from the description column. (*HS baud rates for the 100 samples per sec version only).

Baud Number	Baud Description
1	9600 Baud
2	4800 Baud
3	2400 Baud
4	1200 Baud
5	600 Baud
6	300 Baud (* HS 19.2K)
7	150 Baud (*HS 38.4K)

Parameter 25 Serial Port 2 Mode (4 [8 data bits, no parity])
Enter the mode number from the table below to select the mode parameter in the mode description column.

Mode Number	Mode Description
1	7 data bits, no parity
2	7 data bits, even parity
3	7 data bits, odd parity
4	8 data bits, no parity
5	8 data bits, even parity
6	8 data bits, odd parity

Parameter 26 Serial Port 2 Baud Rate (1 [9600 baud])
Enter a baud number from the table below to select a baud rate from the description column. (*HS baud rates for the 100 samples per sec version only).

Baud Number	Baud Description
1	9600 Baud
2	4800 Baud
3	2400 Baud
4	1200 Baud
5	600 Baud
6	300 Baud (* HS 19.2K)
7	150 Baud (*HS 38.4K)

Parameter 27 TX2 Control / Station ID (255 [single station])
Serial Port 2 can be used for continuous transmission of scale data or as a network buss or for single station remote control.

- Enter a 0 to enable continuous transmission of TX 2 data. The data sent is configured in parameter 28 (TX2 Format).
- Enter a station ID (1 to 254) for multi-drop network configuration
- Enter 255 for single station remote control

Parameter 28 TX2 Format (2 Condec format)
Serial Port 2 can be used for continuous transmission of scale data. The TX2 Format parameter determines what is sent. There are 5 selections:

1 - AND: <status>, <mode>, <polarity><weight><units><terminate>
Status: OL (overload), ST (stable), US (unstable, in motion)
Mode: GS (gross mode), NT (net mode)
Polarity: + (positive weight), - (negative weight)
Weight: 7 characters data, NOT zero blanked, with decimal point
Units: lb, kg, t (ton), tn (tonne), g<sp> (gram), oz
Terminate: lf, cr (line feed, carriage return)

2 - CONDEC: <stx><polarity><weight><units><mode>>status><terminate>
Polarity: space (positive weight), - (negative weight)
Weight: 7 characters, zero blanked, with decimal point
Units: L (lb), K (kg), T (ton), G (gram), O (oz)
Mode: G (gross mode), N (net mode)
Status: <space> (valid weight), M (motion), O (over wt), I(invalid)
Terminate: lf, cr (line feed, carriage return)

3 - WEIGHTRONIX: <mode1><mode2><polarity><weight><space><units><term>
Mode1: space (gross mode), 0 (zero if net mode)
Mode2: G (gross mode), N (net mode)
Polarity: + (positive weight), - (negative weight)
Weight: 6 characters, NOT zero blanked, with decimal point
Units: lb, kg, oz, g <space>(gram), t<space> (ton), tn (tonne)
Terminate: lf, cr (line feed, carriage return)

4 - OHAUS: <polarity><weight><space><units><2 spaces><mode><status><term>
Polarity: space (positive weight), - (negative weight)
Weight: 7 digits, zero blanked, with decimal point
Units: lb, kg, oz, g <space>(gram), t<space> (ton), tn (tonne)
Mode: G (gross mode), N (net mode)
Status: <space> (valid weight), M (motion), O (over wt), I(invalid)
Terminate: lf, cr (line feed, carriage return)

5 - Print label 85: transmits the contents of parameter 85 (print label 85)
Data entered into a print label can include register data:
[253] [reg no] buffer register data, minimum size (zero blanked no spaces)
[254] [reg no] buffer data, 7 character field, zero blanked, right justified.

Printer Parameters

The AD-5200 & AD-5300 provide a universal printer interface for various printers. The printer interface allows you to select and customize the data output for serial printers. The serial interface option uses Serial Port 1 (TB3) for connection to the printer. Refer to the “HARDWARE INSTALLATION AND WIRING “ section for information on connector pin designations.

Parameter 29 Printer Port Select (2 [Serial Port 1])
Enter a number from the following list to select a printer option:

2 Serial Printer interface.

Parameter 30 Auto Print LF after CR (1 [yes])
Some printers require a line feed character (LF) to advance the paper and some printers advance the paper with only a carriage return character (CR).

Enter a 1 to automatically add a line feed after a carriage return.
Enter a 0 to NOT add a line feed after a carriage return.

Parameter 31 End of Print Character (13 [CR])
The end of print character is sent to the printer at the end of a print transmission. If your printer requires a special character to release the paper or to form feed the paper, enter the code here. The ASCII chart in the appendix lists the ASCII codes and their numeric values. Enter a 0 (zero) if no end of print character is required.

Parameters 32, 33 34, 84, 85, 86, 87, 88, 89 and 90 Print Labels
The AD-5200 & AD-5300 provide 7 programmable print labels. They are available for printing company name, address, station ID, or other messages. Labels 32, 33, and 34 are up to 16 characters long; labels 84 - 90 are up to 30 characters long. Use the ASCII chart in the appendix to look up the numeric values of the ASCII codes. Data entered into a print label can include register data:

[253] [reg no]buffer register data, minimum size (zero blanked no spaces)
[254] [reg no]buffer register data, 7 character field, right justified

Or time & date [253][110], time [253][111], date [253][112].

Example: Print "Total [reg 1 data] ton". Select parameter 32 to begin Print Label 1 entry. The display prompts “C0 xxx” where xxx is the current character 0 entry. Enter:

84, 111, 116, 97, 108, 32, 254, 1, 32, 116, 111, 110, 13, 0
T o t a l <reg1> t o n <cr>
Remember to enter a 0 as the last entry of the print label.

Parameters 35, 36, 37, and 38: Print Codes
The AD-5200 & AD-5300 provide 4 programmable print codes. The print codes are used to send special setup parameters to the printer, such as select print size or select print font. Each print code is up to 4 characters long. Consult your printer manual for the print codes that you may want to use. Enter the codes in decimal format (an ASCII carriage return = 13). Select parameter 35 to begin print code 1 entry. The AD-5200 & AD-5300 prompts “C0 XXX” where xxx is the current character 0 print code value. Enter data for character 0. The AD-5200 & AD-5300 prompts “C1 XXX”. Continue the code entry. Enter a 0 to end print code entry.

Parameter 39 Enable TTL Remote Control (1 [enabled])
Use parameter 39 to enable remote control using TTL inputs 1 thru 3 (TB3 pins 8-10).

Enter a 1 to use TTL inputs 1-3 to activate scale basic functions 1 - 3. For example, grounding TB3 pin 8 (TTL input 1) activates scale basic function 1. Enter a 0 to disable TTL remote control.

Display Intensity, Battery, Watch Dog Timer

Parameter 40 Display Intensity (10)

Use parameter 40 to set the brightness of the AD-5200 & AD-5300 numeric display and LED indicators. The brightness can be set from 1 (dimmest) to 15 (brightest).

Parameter 41 Battery Backup (0 [no])

The battery is used to preserve the time and date, memory registers, and ID memory when power is lost. Set the Battery Backup parameter to ON (1) to prevent the AD-5200 & AD-5300 from clearing memory when power is restored, set parameter 41 to OFF (0) to erase memory when power is restored.

Parameter 42 Enable Watch Dog Timer (0 [no])

The watchdog timer resets the AD-5200 & AD-5300 when the weight display is not updated within the time-out time (0.2 sec). Set the Enable ON (1) to reset after time-out. Set the Enable OFF (0) to turn off the watchdog timer.

Parameters 43-50 Fixed Registers

The Fixed Registers are used by the Trip-Level Event Monitor to determine when a trip-level is reached. See the “Scale Basic / Event Monitor” manual for more information. Parameters 43 thru 50 select Fixed Setpoints 1 thru 8. Select the parameter number to be changed and then enter the trip-level weight.

Parameters 51-58 Keyboard Event Functions

The keyboard event functions determine what actions take place when a key is pressed. The Power on start function activates a function when power is applied to the indicator.

Number	Parameter Name	Default Value	Password
51	Power on start function	0 (no function executed)	2
52	PRINT key function	136 (Print function)	2
53	UNITS key function	127 (Units toggle function)	2
54	Gross/Net key function	128 (Gross/Net toggle)	2
55	TARE key function	129 (Tare function)	2
56	ZERO key function	130 (Tare function)	2
57	Function Key 1 (F1)	0 (no function executed)	2
58	Function Key 2 (F2)	0 (no function executed)	2

Parameter Functions

The parameter functions are used to set parameters that are too complex for a single numeric entry. The following table lists the parameter functions:

Parameter Functions

Fn. No	Function Name	Password Level
59	Display Calibration Audit Number	0
60	Calibrate Scale - deadload first	3
61	Calibrate Scale - span first	3
62	Calibrate Deadload Only	3
63	Adjust Gain Calibration	3
64	Configure Passwords	2
65	Configure Print Formats	2
66	Set Time and Date	2
67	Display Operation Parameters	0
68	Print Operation Parameters	0
69	Diagnostic Tests	0
70	Initialize Operation Parameters to factory defaults.	3
71	Configure Event Monitor	2
72	Function Editor	2&3
73	Initialize Function Memory	2
74	Debug mode for Event monitors and Scale basic fns.	2
75	Enable Peak Detect (optional)	2
76	Set debug mode for event monitors and scale basic fns.	2
78	Erase Id Memory	1
79	Enable Multi-point Linearization (default = disabled[0])	3
80	Calibrate using Multi-point Linearization	3
81	Analog output span (default = 10,000)	1
82	Analog output offset (default = 0)	1
83	Analog output register (default = 0 [disabled])	1

The Password Level is used to prevent unauthorized access to parameter functions. See Parameter Function 64, “Configure Passwords”, for more information on passwords.

Access Parameter Functions

Hold the CLEAR key down and press the ENTER key. The numeric display prompts “CFG xx” where xx is the currently selected parameter. Enter a parameter function number and then press the ENTER key. NOTE: use the UNITS key (↓) and the PRINT key (↑) to scroll the CFG parameter number. Press the UNITS key to increment the CFG number, press the PRINT key to decrement the CFG number.

To exit configuration and store changes, press the CLEAR key when "CFG xx" is being displayed.

To exit configuration and NOT store changes, enter 999 when "CFG xx" is being displayed. The display prompts "Abort". Press the ENTER key to abort (exit without saving changes) or press the CLEAR key if you do not want to abort.

Example: Begin Calibration of the Scale-
The AD-5200 & AD-5300 are in the display weight mode. Hold the CLEAR key down and press the ENTER key to enter the configure mode. The AD-5200 & AD-5300 prompts "CFG xx" where xx is the last selected parameter. Enter 60 and then press the ENTER key. The AD-5200 & AD-5300 prompts "dEAdld". Begin the calibration process or press the CLEAR key to exit.

Function 59 Display Calibration Audit Number

Use function 59 to view the audit and configuration numbers, the software ID number, and the status of the internal function lock.

The AD-5200 & AD-5300 provide a calibration audit number and a configuration number. They are used to indicate changes to calibration data and configuration data and can be used in place of mechanical seals by some regulatory agencies. The AD-5200 & AD-5300 audit number increments each time a calibration parameter is changed (deadload or weight conversion factor). The configuration number increments each time a password level 3 parameter is changed. If physical seals are used, then place the internal function lock in the locked position before sealing. Calibration and password level 3 parameters cannot be accessed when the function lock is in the locked position.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 59. The AD-5200 & AD-5300 prompts "A xxxx" where xxxx is the audit number.
3. Press the ENTER key. The AD-5200 & AD-5300 prompts "C xxxx" where xxxx is the current calibration number.
4. Press the ENTER key. The AD-5200 & AD-5300 prompts "bixxxx" where bixxxx is the ID number of the software installed in the AD-5200 or AD-5300.
5. Press the ENTER key. The AD-5200 & AD-5300 prompt "un-LoC" if the function lock is in the unlocked position, or "Loc Ed" if the function is in the locked position.

Function 60 Calibrate Scale - Deadload First

Use function 60 to calibrate the scale by reading the deadload first and then reading the span. Set the Scale Operation Parameters before using function 60. Best results are obtained when the AD-5200 & AD-5300 load cells have reached thermal equilibrium (power applied for approximately 30 to 120 minutes depending on load cell size). NOTE: function 60 automatically adjusts parameter 19 (deadload offset).

Hold the CLEAR key down and press the ENTER key to enter the configure mode.

1. Enter CFG 60. The AD-5200 & AD-5300 prompt “dEAdld”. Remove all weight from the scale. Press the ENTER key. The AD-5200 & AD-5300 read the scale’s deadload weight. NOTE: press the CONTINUE key (Units) to skip deadload read.
2. The AD-5200 & AD-5300 display alternates between “CALib” and the weight on the scale. Place the calibration weight on the scale. Enter the calibration weight using the numeric keypad. Press the ENTER key. The AD-5200 & AD-5300 reads the calibration weight. If an error is made in data entry, press the PRINT (↑) key to re-enter the calibration weight.
3. The AD-5200 & AD-5300 prompt “CFG 60”. Press the CLEAR key to exit the configure mode.

Function 61 Calibrate Scale - Span First

Use function 61 to calibrate the scale by reading the span first and then reading the deadload. Set the Scale Operation Parameters before using function 61. Best results are obtained when the AD-5200 & AD-5300 load cells have reached thermal equilibrium (power applied for approximately 30 to 120 minutes depending on load cell size).

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 61. The AD-5200 & AD-5300 display alternates between “CALib” and the weight on the scale. Place the calibration weight on the scale. Enter the calibration weight and press the ENTER key. The AD-5200 & AD-5300 read the calibration weight.
3. The AD-5200 & AD-5300 prompt “dEAdld”. Remove all weight from the scale. Press the ENTER key. The AD-5200 & AD-5300 read the scale’s deadload weight.
4. The AD-5200 & AD-5300 prompt “CFG 61”. Press the CLEAR key to exit the configure mode.

Function 62 Calibrate Deadload Only

Use function 62 to re-calibrate the deadload weight without affecting the span calibration.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 62. The AD-5200 & AD-5300 prompt “dEAdld”. Remove all weight from the scale. Press the ENTER key. The AD-5200 & AD-5300 read the scale’s deadload weight.
3. The AD-5200 & AD-5300 prompt “CFG 62”. Press the CLEAR key to exit the configure mode.

Function 63 Adjust Gain Calibration

Use function 63 to make small adjustments to the span calibration factor. Zero the scale and then place a known weight on the scale.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 63. The AD-5200 & AD-5300 display the weight on the scale along with a center of digit indication in the least significant digit position of the display (the minus sign (-) indicates the center of digit.
3. Press the ‘1’ key to adjust by 1, press the ‘2’ key to adjust by 10, the ‘3’ key to adjust by 100, or the 4 key to adjust by 1000. Use the UNITS key (↓) and the PRINT key (↑) to increase or decrease the displayed weight until the displayed weight is the same as the weight on the scale. The center of digit indicator (-) should be displayed for maximum accuracy.
4. Press the CLEAR key to exit Adjust Gain procedure.

Adjust Gain – 5 Point Linearization

If 5 point Linearization is enabled, the gain adjust procedure begins with the display alternating between the calibration number (example: Cal 1) and the calibration weight.

- Press the ENTER key to adjust the gain at the displayed calibration point.
- Press the UNITS key (↓) to adjust the next calibration point
- Press the PRINT key (↑) adjust the previous calibration point.
- Press the ZERO key to clear a calibration point. (Must re-calibrate to reuse).

Function 64 Configure Passwords

Use function 64 to enter password data. The AD-5200 & AD-5300 provide three security passwords that can be activated and entered to protect configuration data. Password 1 is used to protect I/O port configuration, setpoint, and event monitor data. Password 2 is used to protect calibration and scale configuration data. Security level 3 provides extra protection for password level 2 data. Security level 3 requires the entry of password 2 and the Function Lock inside the AD-5200 & AD-5300 to be in the unlocked position. Password 3 will inhibit viewing, changing, and uploading of Scale Basic functions to a PC when password is active but will allow downloading a new Scale Basic program from the PC to the indicator. All passwords will be disabled once the new program has been downloaded into the indicator and should be reactivated.

The Operation Parameter Reference Table lists the configuration parameters and the password/security level required to access them. The AD-5200 & AD-5300 prompt “PASS 1” when a parameter is selected that requires password level 1. If the entered password is incorrect, the AD-5200 & AD-5300 display “Error”. Press the ENTER key to try again. Press the CLEAR to exit from password entry.

IMPORTANT NOTE: Write down the passwords and put them in a safe place. If you loose and forget a password, there is no way to access the protected functions.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 64. The AD-5200 & AD-5300 prompt “P1 xxxx” where xxxx is the current password number. Enter a new password number or press the ENTER key to use the displayed number. Enter a 0 (zero) for the password number to disable the password.
3. The AD-5200 & AD-5300 prompt “P2 xxxx”. Enter password 2 data.
4. The AD-5200 & AD-5300 prompt “P3 xxxx”. Enter password 3 data.

Function 65 Configure Print Formats

Use function 65 to modify print formats to meet your print requirements. The print formats are grouped into PAGES that are used for generating print data onto a form. Each page is organized into rows and columns as follows:

Line No.	Column No.	Item No.

Line No. = Line number on the page to print the item on.
Column No. = Column position where item print begins.
Item No. = Item to print.

Configure Print Formats

Print format design requires you to become familiar with the PAGE LIST and the PRINT ITEM LIST. The PAGE LIST describes how each PAGE is used. The PRINT ITEM LIST describes what ITEMS can be included in each page. Use the print format worksheets to design new print formats. The PRINT FORMAT DESIGN EXAMPLE illustrates how a print format is designed. A list of the default print formats is found in DEFAULT PRINT FORMATS. The print formats (PAGES) are initialized to factory settings when the Initialize System Parameters function is used. (parameter function 73).

Modify or Design a Print Format

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode. Enter CFG number 65.
2. The AD-5200 & AD-5300 prompt "PAGE". Enter the Page number that you want to modify.
3. The AD-5200 & AD-5300 prompt "Px E1" where x is the page number that you entered and E1 indicates that the current entry being modified is entry 1. Press the ENTER key.
4. The AD-5200 & AD-5300 prompt "L x" where x is the line number on the page that entry 1 is to print on. Enter a new line number or press ENTER to use the displayed number.
5. The AD-5200 & AD-5300 prompt "C x" where x is the column number on the page that entry 1 is to print on. Enter a new column number or press ENTER to use the displayed number.

6. The AD-5200 & AD-5300 prompt “i x” where x is the item number that is to be printed. (See Print Item List for a description of items that can be printed). Enter a new item number or press the ENTER key to use the displayed number.
7. The AD-5200 & AD-5300 prompt “Px E2”. Use the procedure above to modify entry 2. Use the UNITS key (↓) to scroll forward in the page table, use the PRINT key (↑) to scroll backwards.
6. 8. Enter a zero (0) for the line number (L 0) after the last entry that is to be printed. Press the CLEAR key to exit from the current page. NOTE: If the 16th entry is used, then a zero entry for the line number is not necessary.

Page List

FORMAT	DESCRIPTION
PAGE 1	Prints when the indicator is in the GROSS weight mode.
PAGE 2	Prints when the indicator is in the NET weight mode.
PAGE 3	Used by Scale Basic functions when needed.
PAGE 4	Used by Scale Basic functions when needed.

Print Item List

Item #	Description
2-4	Print Label 1, 2, and 3 (see chap. 5: Set I/O Port, parameters 32-34)
84-90	Print Labels 4 thru 10. (Parameters 84-90)
5	Gross Weight (primary units)
6	Tare Weight (primary units)
7	Net Weight (primary units)
8	Gross Weight labeled “WEIGHT” (primary units)
9	Scale Status (used by continuous transmit)
10	Time and Date
11	Time
12	Date
15	Gross Weight (alternate units)
16	Tare Weight (alternate units)
17	Net Weight (alternate units)
18	The Displayed weight (in the displayed units and mode)
21	Print Code 1 (see section: Set I/O Port Parameters, params 35-38)
22	Print Code 2
23	Print Code 3
24	Print Code 4
25	Gross Weight (display units)
26	Tare Weight (display units)
27	Net Weight (display units)
32	Space holder, does nothing.
33	Form Feed (ASCII 12)
34	Carriage Return (ASCII 13)
35	Line Feed (ASCII 10)
40	ID number
41	ID total (ID register 1)
42-46	ID registers 2 through 6
51-66	Memory registers 1 through 16
84-90	Print Labels 84 to 90 (see parameters 84 to 90)

Print Format Design Example

EXAMPLE PRINT:

```
        1111111111222222222233333333334
COLUMN
    12345678901234567890123456789012345678901
LINE
  1
  2
  3                GROSS    54785 LB
  4                TARE     12451 LB
  5                NET      42243 LB
  6
  7            TIME 03:45 PM   DATE 05 AUG 1999
```

EXAMPLE FORMAT DESIGN WORKSHEET:

Page:1	Item Description	Line No.	Column	Item No.
E1	Gross Weight	3	4	5
E2	Tare Weight	4	4	6
E3	Net Weight	5	4	7
E4	Time and Date	7	1	10
E5	End of Print	0	0	0

NOTE: A zero in the Line No column terminates printing. Use zero only after all required information has been entered. The maximum number of entries is 16. If the 16th entry is used, a line number 0 is not required.

Default Print Formats

The print formats (PAGES) are initialized to the following factory settings when the AD-5200 & AD-5300 are initialized.

Page 1	Item Description	Line No.	Column	Item No.
E1	The Displayed Weight	1	1	18
E2	End of Print	0	0	0

Page 2	Item Description	Line No.	Column	Item No.
E1	Gross Wt. (primary units)	3	5	5
E2	Tare Weight (primary units)	4	5	6
E3	Net Weight (primary units)	5	5	7
E4	End of Print	0	0	0

Format Design Worksheets

Page	Item Description	Line No.	Column	Item No.
E1				
E2				
E3				
E4				
E5				
E6				
E7				
E8				
E9				
E10				
E11				
E12				
E13				
E14				
E15				
E16				

Page	Item Description	Line No.	Column	Item No.
E1				
E2				
E3				
E4				
E5				
E6				
E7				
E8				
E9				
E10				
E11				
E12				
E13				
E14				
E15				
E16				

Function 66 Set Time and Date

Use function 66 to set the time and date. Entering 19 can display the time and date when the meter is in the idle mode. Date will be printed in a four-digit year.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 66. The AD-5200 & AD-5300 prompt “t”. Enter the time using 5 digits. The last digit should be 0 for AM, 1 for PM, or 2 for 24-hour time.
3. The AD-5200 & AD-5300 prompt “D”. Enter the date using 6 digits in the format MMDDYY.

Function 67 Display Operation Parameters

Use function 67 to view operation parameters. This function allows viewing the parameters when the password is not available.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 67. The AD-5200 & AD-5300 prompt “PAR xx” where xx is the currently selected parameter number. Press the ENTER key to view the parameter data or enter a parameter number to view.
3. Press the CLEAR key to exit function 67.

Function 68 Print Operation Parameters

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 68. The AD-5200 & AD-5300 prompt “Print”. Press the ENTER key to print the operation parameters or press the CLEAR key to exit without printing.

Function 69 Diagnostic Tests

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 69. The AD-5200 & AD-5300 prompt “diA xx” where xx is the currently selected test number. Enter a test number or press the ENTER key to use the displayed number.
3. The AD-5200 & AD-5300 begin the selected test. Press the CLEAR key when the test is complete.

Test #	Hardware Tested	Description
1	Serial Com. Port 1	Display input data.
2	Serial Com. Port 1	Display input error count.
3	Serial Com. Port 1	Transmit data.
4	Serial Com. Port 2	Display input data.
5	Serial Com. Port 2	Display input error count.
6	Serial Com. Port 2	Transmit data.
8	A/D converter	Display raw conversion data.
9	Ram Memory	Test memory for errors.
10	Display	Turn on all LED’s and display segments.
11	Configuration	Print the EAROM configuration data.
12	Serial Com. Port 1	Transmit/Receive loop-back test.
13	Serial Com. Port 2	Transmit/Receive loop-back test.

See section: Diagnostic Tests for more information on each test.

Function 70 Initialize Operation Parameters to Factory Defaults

Use function 70 to reset the AD-5200 & AD-5300 operation parameters to their factory default values. This function is used to reset the AD-5200 & AD-5300 earom when a new EPROM program is installed. Do NOT use this function unless you are ready to begin installation from the beginning.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 70. The AD-5200 & AD-5300 prompt, “rESEt”. Press the ENTER key to reset operation parameters or press the CLEAR key to exit without changing the operation parameters.
3. **NOTE**: enter 10809 when the display prompts, “rESEt” to reset the calibration factors to the factory defaults.

Function 71 Configure Event Monitor

Use function 71 to enter setpoint data into the Event Monitor. See the “Scale Basic / Event Monitor” manual” for more information on the event monitor parameters.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 71. The AD-5200 & AD-5300 prompt “Eno”. Enter the Event number to be modified.
3. The AD-5200 & AD-5300 prompt “P0 xx” where P0 is parameter 0 and xx is the current value of parameter 0. Enter new data for P0 or press the ENTER key to use the displayed data.
4. Use the UNITS key (↓) or the PRINT key (↑) to scroll through the parameter numbers. Press the CLEAR key to exit from the current Event number. Press the CLEAR key again to exit from event monitor data entry.

Function 72 Scale Basic Function Editor

Use function 72 to create or modify Scale Basic functions. See the “Scale Basic / Event Monitor” manual for more information on Scale Basic functions.

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 72. The AD-5200 & AD-5300 prompt “Fn”. Enter the function number to be modified.
3. The AD-5200 & AD-5300 prompt “0- xxx” where 0- is entry zero, and xxx is the current value for entry zero. Enter new data for 0- or press the ENTER key to use the displayed data.
4. Use the UNITS key (↓) or the PRINT key (↑) to scroll through the entry numbers. Press the CLEAR key to exit from the Function Editor.

Function 73 Initialize Function Memory

The initialize function erases function memory and setpoint monitor memory, and initializes all parameters with password level 1 or 2.

Function 73 prompts “rs Fn” . Press the Enter key to initialize only or enter a number below to activate a built in program.

1. Fill to Setpoint.
2. Checkweigh: Over/Between/Under
3. Weigh-in / Weigh-out
4. Axle Weigh – Short Scale
5. Axle Weigh – Long Scale
6. ID Tare and Total
7. Peak Hold

Function 74 Configure Timers

The display prompts “tr” when function 74 is activated. Enter the timer number to be modified (1 to 5) then press the ENTER key. The first parameter (L) is the time length in tenths of a second. The second parameter (Fn) is the function number to be executed when the timer times out.

Parameter 75 Enable Peak Detect

Enter a 1 to enable peak detect, enter a 0 to disable peak detect.

Parameter 76 Debug mode for Event monitors and Scale Basic

The Debug mode is used to ‘debug’ event monitors and scale basic functions. Enter a 1 to activate debug mode, enter a 0 to disable debug mode. When debug mode is enabled Scale Basic functions ‘single step’. The subroutine stack level and the Function number are displayed when entering a function. Example: “0 F12”. Press the ENTER key to begin execution of the function. The instruction address and instruction code are displayed. Example: “21 255”. Continue to press the ENTER key to step thru the program. NOTE: The first step displayed for all scale basic functions is a GOTO (244).

Function 78 Initialize ID memory

Use function 78 to initialize id memory after it has been corrupted. The ID memory becomes corrupted when power is lost (when battery backup is disabled) or when the battery is allowed to discharge below 2 volts.

Parameter 79 Enable Multi-point Linearization

Enter a to 1 to enable multi-point Linearization, enter a to 0 to disable multi-point Linearization. The AD-5200 & AD-5300 use the calibration factors set in function 80 below when multi-point Linearization is enabled.

Function 80 Calibrate - Multi-point Linearization

Use function 80 to calibrate the scale using up to 5 calibration points to 'linearize' the load cell. Set the Scale Operation Parameters before using function 80. Best results are obtained when the indicator and load cells have reached thermal equilibrium (power applied for approximately 30 to 120 minutes depending on load cell size). NOTE: function 80 automatically adjusts parameter 19 (deadload offset).

1. Hold the CLEAR key down and press the ENTER key to enter the configure mode.
2. Enter CFG 80. The AD-5200 & AD-5300 prompt "dEAdld". Remove all weight from the scale. Press the ENTER key to obtain the deadload weight. Press the Units key (↓) to continue without reading a new deadload weight.
3. The AD-5200 & AD-5300‘s display alternates between "CAL 1" and the weight on the scale. Place the first calibration weight on the scale. Enter the calibration weight using the numeric keypad. Press the ENTER key. The AD-5200 & AD-5300 reads the calibration weight.
4. The AD-5200 & AD-5300‘s display alternates between "CAL 2" and the weight on the scale. Repeat step 3. The AD-5200 & AD-5300 will accept up to 5 calibration points. Press the CLEAR key to complete calibration if less than 5 calibration points are used.
5. The AD-5200 & AD-5300 prompt "CFG 80". Press the CLEAR key to exit the configure mode.

Diagnostic Tests

The DIAGNOSTIC TESTS are accessed using configuration function 69. Hold the CLEAR key down and press the ENTER key. The display prompts “CFG xx” where xx is the currently selected parameter. Enter 69 and press the ENTER key to access the DIAGNOSTIC TESTS.

The display prompts “diA xx” where xx is the last selected diagnostic function. Select a test number from the table below. Enter the test number and press the ENTER key.

Table of Diagnostic Tests

Test No.	Hardware Tested	Description
1	Serial Com. Port 1	Display input data.
2	Serial Com. Port 1	Display input error count.
3	Serial Com. Port 1	Transmit data.
4	Serial Com. Port 2	Display input data.
5	Serial Com. Port 2	Display input error count.
6	Serial Com. Port 2	Transmit data.
8	A/D converter	Display raw conversion data.
9	Ram Memory	Test memory for errors.
10	Display	Turn on all LED’s and display segments.
11	Configuration	Print the EAROM configuration data.
12	Serial Com. Port 1	Transmit/Receive loop-back test.
13	Serial Com. Port 2	Transmit/Receive loop-back test.

Diagnostic Test 1: Serial Com Port 1 - Display Input Data

This test displays serial data as it is received by serial communications port 1. The numeric display has limited alpha display capability, however numeric and some alpha characters are legible. If all data being received is unintelligible, the baud rate is probably incorrect. If nothing is displayed on the display, then check the following:

1. RS232/Current loop switch on the main circuit board.
2. Cabling between the communicating units.
3. Make sure the sending unit is actually sending data.

Press the CLEAR key to exit diagnostic test 1.

Diagnostic Test 2: Serial Com Port 1 – Display Errors

This test displays the number of framing and parity errors that are detected in the input data stream. The error count is set to zero when entering this test. New errors are displayed as “PxxFxx” where Pxx is the number of parity errors and Fxx is the number of framing errors. If the error count exceeds 99, the display will remain at 99. Press the CLEAR key to exit Diagnostic test 2.

Diagnostic Test 3: Serial Com Port 1 - Transmit Data

This test transmits data out of serial communications port 1. The display prompts: “OUT 0”. Press the ENTER key to send data. Serial Port 1 transmits “1234567890ABCDEF” and prompts “OUT 1” to indicate that 1 transmission has occurred. Press the ENTER key again or press the CLEAR key to exit diagnostic test 3.

Diagnostic Test 4: Serial Com Port 2 - Display Input Data

This test displays serial data as it is received by serial communications port 2. The numeric display has limited alpha display capability, however numeric and some alpha characters are legible. If all data being received is unintelligible, the baud rate is probably incorrect. If nothing is displayed on the display, then check the following:

1. RS232/RS485 jumper on the main circuit board.
2. Cabling between the communicating units.
3. Make sure the sending unit is actually sending data.

Press the CLEAR key to exit diagnostic test 4.

Diagnostic Test 5: Serial Com Port 2 – Display Errors

This test displays the number of framing and parity errors that are detected in the input data stream. The error count is set to zero when entering this test. New errors are displayed as “PxxFxx” where Pxx is the number of parity errors and Fxx is the number of framing errors. If the error count exceeds 99, the display will remain at 99. Press the CLEAR key to exit Diagnostic test 5.

Diagnostic Test 6: Serial Com Port 2 - Transmit Data

This test transmits data out of serial communications port 2. The display prompts: “OUT 0”. Press the ENTER key to send data. Serial Port 2 transmits “1234567890ABCDEF” and prompts “OUT 1” to indicate that 1 transmission has occurred. Press the ENTER key again or press the CLEAR key to exit diagnostic test 6.

Diagnostic Test 7: Not used

Diagnostic Test 8: Test A/D

This test displays the (filtered) raw data being read from the A/D converter. Use this test to determine optimum deadload and gain settings. If the number displayed at deadload is less than 1000 or greater than 250,000 then use the deadload offset (parameter 19) to add or subtract deadload from the signal input. **NOTE:** deadload offset is automatically set using the calibration function 60. If the full-scale number displayed is less than 380,000 then use the “loadcell mv/V” parameter 1 to increase the gain. If the full-scale signal is greater than 1,000,000 then use the “loadcell mv/V” parameter 1 to decrease the gain.

If no data is being displayed, the A/D converter is “locked up”. Turn power off and then on and re-activate the test. Check load cell wiring for reversed signal or excitation signals.

Press the PRINT key to scroll the AD test function from:

1. Display raw data (digital filter on).
2. Display and transmit via serial port 2, raw data (digital filter off).
3. Display A/D drift. Press the ENTER key to clear the drift factor to 0.

Press the CLEAR key to exit AD test.

Diagnostic Test 9: Perform internal memory test

This test writes data to memory and then reads it back to test for failed memory locations. The existing data in memory is not affected by this test. The display prompts, “r TEST” while the test is in progress. The display prompts “PAS 32” if the test is successful. If an error is detected the “Exxxx” is displayed, where xxxx is the location of the error.

Diagnostic Test 10: Lamp Test

This test turns on all the LED displays and numeric display segments. Replace any LED or display that does not illuminate. Press the CLEAR key to exit diagnostic test 10.

Diagnostic Test 11: Print the EAROM Configuration Table

This function sends the contents to the EAROM configuration memory to the printer. Use this function to document your setup of the when installation is complete.

Diagnostic Tests 12 & 13: Loop Back Tests

These tests are used by the factory to test the serial ports transmit and receive functions. Transmit and receive lines must be jumpered together.

Troubleshooting

The following table describes the probable causes to some problems you may encounter. Most problems can be resolved by using the information provided in the table.

Printer does not print (serial RS232)	* Cable connection problem or invalid pin connections. * Baud rate and format on serial port 1 does not match printer. * Transmitter/receiver IC damaged (U3 MC145406).
Continuous output does not update	* "TX CONTINUOUS" disabled (configuration Parameter 28) * Cable connection problem or invalid pin connections. * Baud rate and format on serial port 2 does not match receiver. * Transmitter/receiver IC damaged (U3 MC145406).
Input port 1 not working	* Baud rate and format on serial port 1 does not match host. *Cable connection problem or invalid pin connections. . *RS232 transmitter/receiver IC damaged (U3 MC145406).
Input port 2 not working	* Baud rate and format on serial port 2 does not match host. * Cable connection problem or invalid pin connections. * Internal jumper JP3 (RS232/422/485) not set properly. * RS232 transmitter/receiver IC damaged (U3 MC145406). * RS422/485 transmitter/receiver IC damaged (RS422 {U11 75176} RS485 {U7 75176}).
Invalid weight display or weight fluctuating	* Invalid calibration parameters. * Load cell or load cell input cable problems.

Error Messages

Error	Description
Err 0	Power on zero error. See parameter 20.
Err 1	Keyboard error. Occurs during power up while a key on the keyboard is being pressed or one of the remote switch inputs is activated.
Err 2	Restart Trap. The microprocessor accessed nonexistent memory location. Usual cause is A/C power “glitch” or static electric discharge.
Err 3	Watchdog Time-out. The weight display has not been updated within the watchdog time-out period. Usual cause is A/C power glitch or static electric discharge.
Err 4	Battery Error. Battery voltage level was below 2 V when the indicator was powered off.
Err 5	Earom memory error. A checksum error has occurred when reading the configuration earom memory. Check calibration parameters and rewrite the earom memory. If error continues, replace earom (U12)
Err 5.1	Earom Time-out, unable to write to the earom memory.
Err 6	Ram memory error. A ram memory error has occurred. Replace U5 if error continues.
Err 7	The A/D converter is “locked up”. Check load cell wiring.
Err 8	Negative deadload error.
Err 9	Count-by error. The entered value is outside the scale count-by set during calibration.
Err 10	Pushbutton ZERO error.
Err 11	A to D converter not working.
Err 12	Negative deadload. Check loadcell wiring. Enter a deadload offset in configuration parameter 19.
Err 14	Page Format line length error. The page format output exceeded the maximum line length.
Err 15	The function selected is locked. Switch 1 (SW1) on the circuit board locks and unlocks configuration parameters.
Err 16	Scale Basic Stack Overflow.
Err 18	Referenced an invalid function instruction.
Err 21	ID not found.
Err 22	Scale Basic Prompt error.
Err 23	ID memory full.
Error OL	Calibration error or scale is over-loaded (above scale capacity).
undEr	Calibration error or scale is under-loaded (below readable weight).

HARDWARE INSTALLATION AND WIRING

This section describes installation and wiring information for the interface ports. There are two bi-directional serial ports, digital port with 3 TTL inputs, 3 TTL outputs, and one load cell input port. The serial ports are used to interface to a printer and to a host device or PC for continuous output. The TTL outputs and inputs are used for remote switch input and relay control. The load cell input is used to interface to the scale platform.

Load Cell Connector – TB1

NOTE: Remove jumpers JP1 and JP2 to enable SENSE LINES for 6 wire load cells. Wire the sheilding from the load cells to the chassis not TB1 pin 7.

Load Cell Terminal Block – TB1

Pin #	Signal Name
1	+ Signal
2	- Signal
3	+ Excitation
4	+ Sense
5	- Sense
6	- Excitation
7	Analog ground (NOT FOR SHIELD)

Power Source AC / DC

The unit comes standard with an onboard transformer the AC interface connector is a 3 pin Molex type, this connects to the motherboard where the 3 pin Molex header is mounted on the board marked A/C power.

For DC power applications there is a 2 position terminal block marked PWR-DC. Note the polarity of the terminals. The positive is marked as (+) the negative (-). The DC power input will exept +12 to +28 VDC. Remove AC power before wiring for DC.

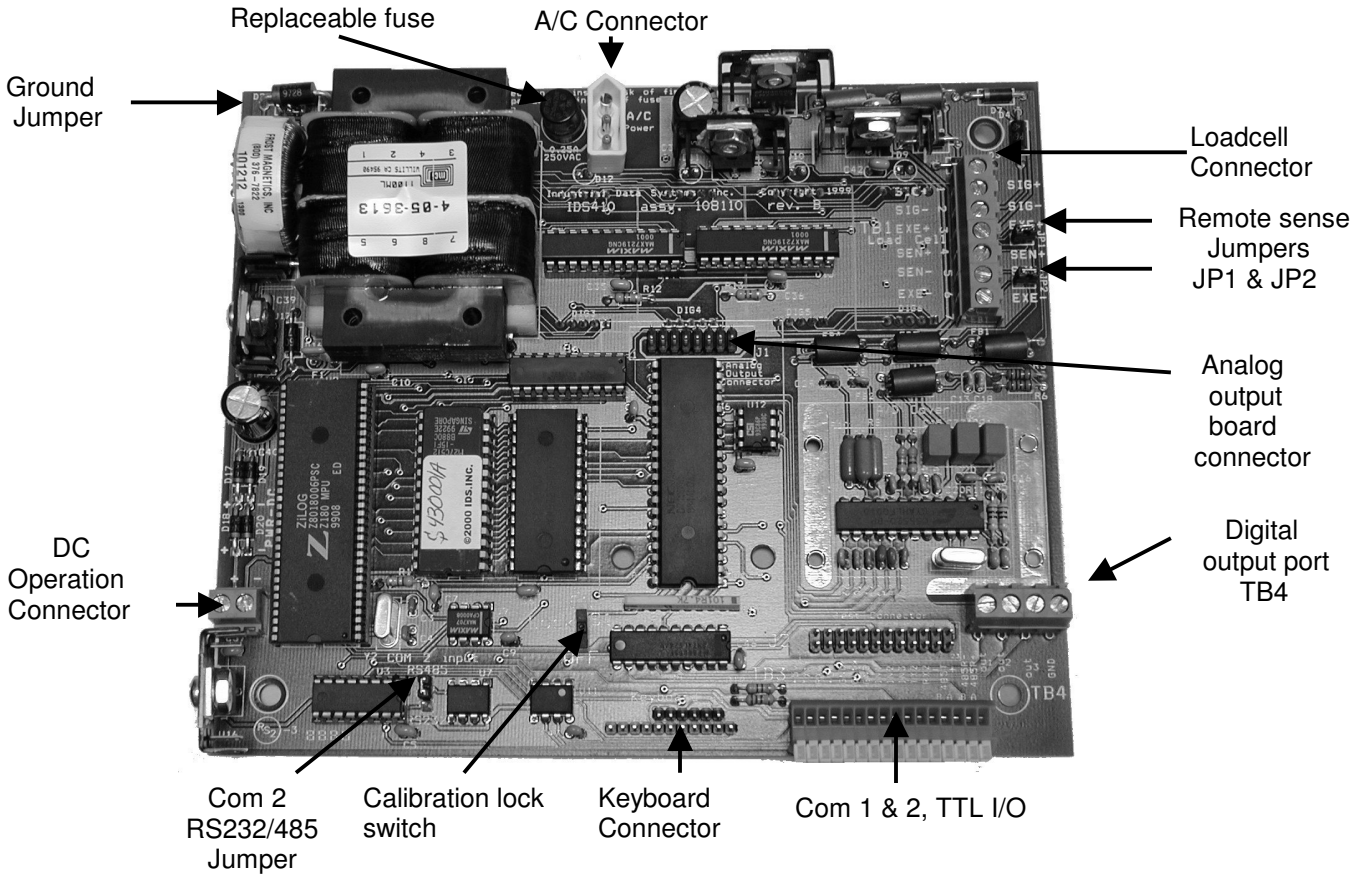
I/O Port Connector - TB 3

The I/O port connector has Com Ports 1 and 2 and the digital TTL inputs.

Pin #	Signal Name
1	+5V (CL2 TX +)
2	TXD 1 (RS232)
3	RXD1 (RS232)
4	Soft +5 volts (220 ohm to +5V)
5	GND (CL1 TX-)
6	CL1 TX +
7	GND
8	TTL IN 1
9	TTL IN 2
10	TTL IN 3

11	TXD 2 (RS232) (CL2 TX -)
12	RXD 2 (RS232)
13	RS485 TX -
14	RS485 TX +
15	RS485 RX -
16	RS485 RX +
Digital Output Port Connector TB4	
1	TTL OUT 1
2	TTL OUT 2
3	TTL OUT 3
4	GROUND

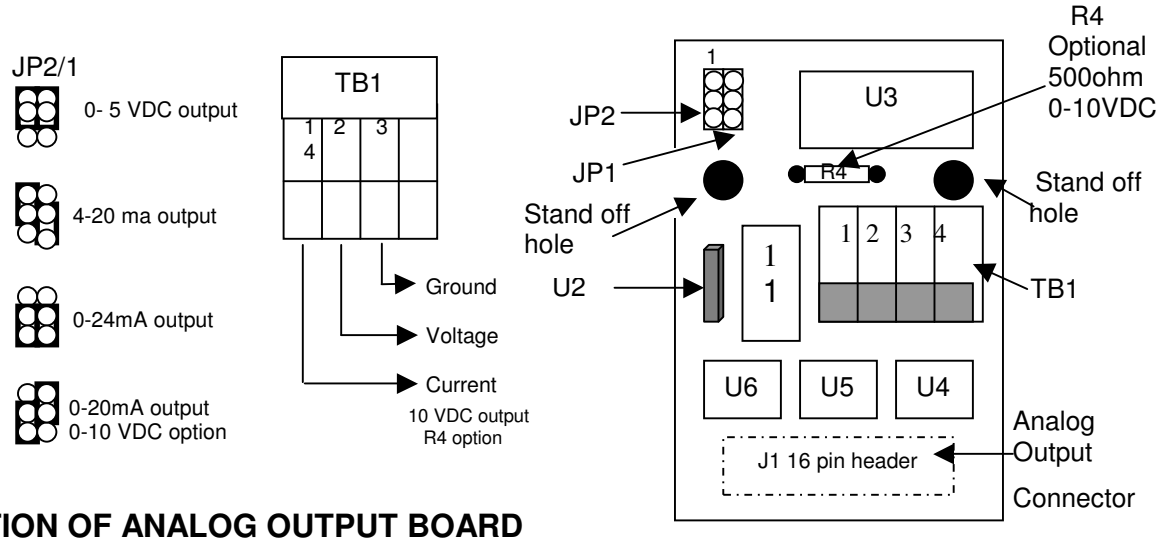
P.C. Board Diagram - Connectors, Jumpers, and Switches



ISOLATED ANALOG OUTPUT OPTION AD-5200 & AD-5300

ANALOG OUTPUT OPTION

The Analog Output option board is internally mounted inside the indicator. The Analog Output has two jumpers, JP1 & JP2. These jumpers are used to configure the output format. Terminal block TB1 is for making external wiring connections. JP1 & JP2 are factory set for 4-20mA. Refer to the diagram below for configuration, format and alternative wiring. No interconnect cables are provided by the factory, the recommended cables used should be suitable for the conduit fittings and should comply with National Electrical code requirements.



INSTALLATION OF ANALOG OUTPUT BOARD

1. Before installation, remove power from the indicator and remove the back plate to access the internal board.
2. Refer to the PC Board Diagram to locate the installation connector and stand off holes on the PC board.
3. Install the (2) plastic standoffs into the holes on the CPU board and plug the analog output board (J1) onto the analog output connector. Secure the analog output module to the CPU board by pushing the standoffs through the holes on the module.
4. Set JP1 and JP2 according to the desired output and connect the external device to TB1 according to the selected output.
5. Apply power to the indicator and configure parameters 81, 82, and 83 as described in the table below.

SETUP PARAMETERS

For proper operation, the following parameters are used to configure the operation of the analog output.

Parameter	Description	Default Value
81	Analog output span (20ma). The value entered here is the display graduations (weight/count-by) and must correspond with the full-scale digits set in parameter 17. If full scale capacity parameter 17= 10,000 then (0 lb's = 4mA 10,000 lb's = 20mA)	10,000 Must set to a value
82	Analog output offset (4ma). The value entered here is the display graduations (weight/count-by) and must correspond with the full-scale digits set in parameter 17.	0 (optional)
83	Analog output register/mode: 64 = Gross reg, 65 = Tare reg, 66 = Net reg (Note: Scale Basic provides other registers (1-61,43-50, 64-68) which can be set based on a mathematical formula) a register must be selected for the output to work	0 (must be set to a reg value)

ASCII CHART

ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC
Null	00	SP	32	@	64	`	96
SOH	01	!	33	A	65	a	97
STX	02	"	34	B	66	b	98
ETX	03	#	35	C	67	c	99
EOT	04	$	36	D	68	d	100
ENQ	05	%	37	E	69	e	101
ACK	06	&	38	F	70	f	102
Bell	07	'	39	G	71	g	103
BS	08	(	40	H	72	h	104
HT	09	)	41	I	73	i	105
LF	10	*	42	J	74	j	106
VT	11	+	43	K	75	k	107
FF	12	,	44	L	76	l	108
CR	13	-	45	M	77	m	109
SO	14	.	46	N	78	n	110
SI	15	/	47	O	79	o	111
DLE	16	0	48	P	80	p	112
XON	17	1	49	Q	81	q	113
TAPE	18	2	50	R	82	r	114
XOFF	19	3	51	S	83	s	115
DC4	20	4	52	T	84	t	116
NAK	21	5	53	U	85	u	117
SYN	22	6	54	V	86	v	118
ETB	23	7	55	W	87	w	119
CAN	24	8	56	X	88	x	120
EM	25	9	57	Y	89	y	121
SUB	26	:	58	Z	90	z	122
ESC	27	;	59	[	91	{	123
FS	28	>	60	\	92	|	124
GS	29	=	61	]	93	}	125
RS	30	>	62	^	94	~	126
US	31	?	63	<-	95	DEL	127

SPECIFICATIONS

STANDARD FEATURES

SCALE SPECIFICATIONS

Display	Bright red LED; 1-inch x 6-digit numeric
Status Indicators	Gross, Net, Motion, Zero, LB, Kg (LED)
Keyboard	19-key sealed tactile feel membrane
Internal Resolution	20-bit A/D Sigma-Delta; 1,048,000 d
Display Resolution	120,000 dd industrial; 10,000 dd HB44
Display increments	Selectable 1, 2, 5, 10,20, 50 100
Decimal Point	Selectable 0, 1, 2, 3, 4 decimal places
Conversation Rate	60 samples/second typical
Signal Sensitivity	0.1 uV/graduation (min)
Signal Range	0.5 mV/V to 6mV/V
Load Cell Excitation	10 ± 0.5VDC (-5 to +5)
Load Cell Power	12 x 350 Ω or 24 x 700 Ω load cells
Auto Zero Tracking	0-60 dd in 1/4 dd increments
Auto Zero Delay	0-25 seconds In 0.1 second increments
Motion Detect	0-60 dd in 1/4 dd increments
Motion Delay	0-25 seconds In 0.1 second increments
Digital Filter	0-18 selectable filter (DSP) levels
Calibration	Selectable multi-point (up to 5) digital calibration to linearize input signal
Watchdog Timer	Enable/disable fault tolerant operation
RFI Protection	Signal, excitation and sense lines
RAM	32K provides 500 ID storage (parts, etc)
Clock Module	Time & Date clock, Leap Year compliant

COMMUNICATIONS

Serial Port 1	Simplex RS232 or 20mA current loop
Serial Port 2	Full duplex RS232 or RS485
Digital Port	3 inputs and 3 outputs; Low active (TTL)
Print Formats	4 user configurable print formats

GENERAL SPECIFICATIONS

Power	110/220VAC ±10% @ 50/60Hz or 12-28 VDC
Power Consumption	10W @ 115VAC; 6W @ 12VDC
Operating Temperature	-10 to +40 °C.
Weight	6 lbs (2.72 kg)
Warranty	2 year limited

OPTIONS

Analog Output Module	Fully isolated 0-10VDC or 4-20mA; 16-bit resolution; 650Ω load resistance
Relay Board	4-channel external relay enclosure
Relay Modules	Input/output solid-state (AC/DC) relays
High speed (HS)	100 samples/second conversion rate; High speed process control applications
Counting	Simple counting, average piece weight, batch counting and ID batch counting
EZ-LINK™	PC software; Facilitates configuration and Scale Basic programming

MODES OF OPERATION

The AD-5200 & AD-5300 are versatile indicators for use in various industries and applications that can range from basic weighing, material testing to more complex formula batch weighing. The indicators are housed in a rugged stainless steel or cold rolled steel enclosure and provide a universal mounting bracket for wall or desk mounting. The viewing angle can be adjusted for the best possible view of the weight. The bright red 1 inch high LED display makes it easy to read the weight from longer distances compared to other indicators. The keyboard features large keys, which give you tactile and audible confirmation of data entry. The indicators are programmable in an easy and flexible macro language called Scale Basic™. In addition to the built-in modes of operation, Scale Basic allows you to customize the operation of the indicators to meet your application requirements. The Scale Basic language provides various commands and functions that include: math operations, I/O control, setpoints, timers, data entry, id storage, message display, and program sequence control among others. Programming the AD-5200 & AD-5300 can be performed through the keyboard or a PC using the optional EZ-LINK™ software that greatly facilitates setup and programming.

MODE 0 - Normal
Basic gross, tare and net weighing

MODE 1 – Fill to Setpoint
Single setpoint fill with relay output control and weight print

MODE 2 - Over/Under Checkweigh
Provides 3 TTL outputs and 2 setpoints to indicate over, under and between weight conditions. Outputs can activate lights or alarms

MODE 3 – Vehicle Weigh-In/Out with Totals
Weigh-In/Out program for up to 529 vehicles, maintains running totals for each vehicle and provides reporting functions

MODE 4 - Multi-Container/Axle Auto Weighing
Auto weighs and prints each weight placed on the scale, each weight is sequentially numbered and accumulated, the total can be printed manually or automatically and provides traffic light control

MODE 5 - Auto Axle Weigh (Long Scales)
Same as Mode 4 but previous axles are auto tared

MODE 6 – ID Tare, Print and Total
Provides tare entry and recall by ID, prints ID, sequence # and GTN weights, keeps running totals by ID, provides reporting functions

MODE 7 - Peak Hold Mode
Display or print the peak gross or net weight detected

A = 7.63" (19.38 cm)
B = 6.88" (17.48 cm)
C = 8.56" (21.74 cm)
D = 2.00" (5.08 cm)
E = 3.00" (7.62 cm)